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April 1988

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THE COLOR COMPUTER MONTHLY MAGAZINE

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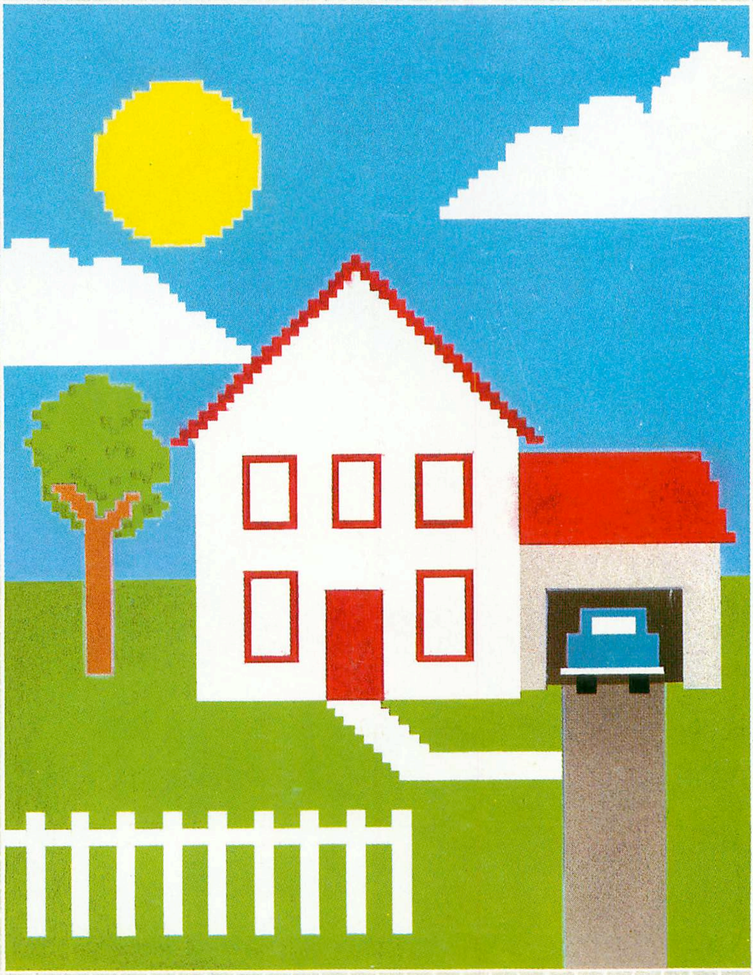

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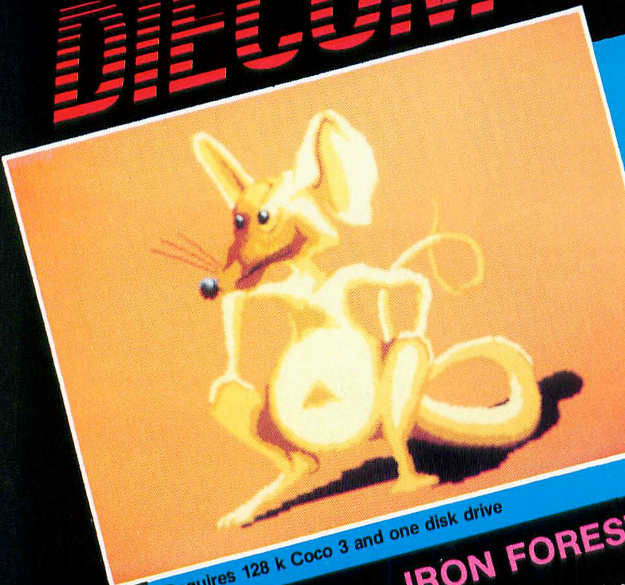

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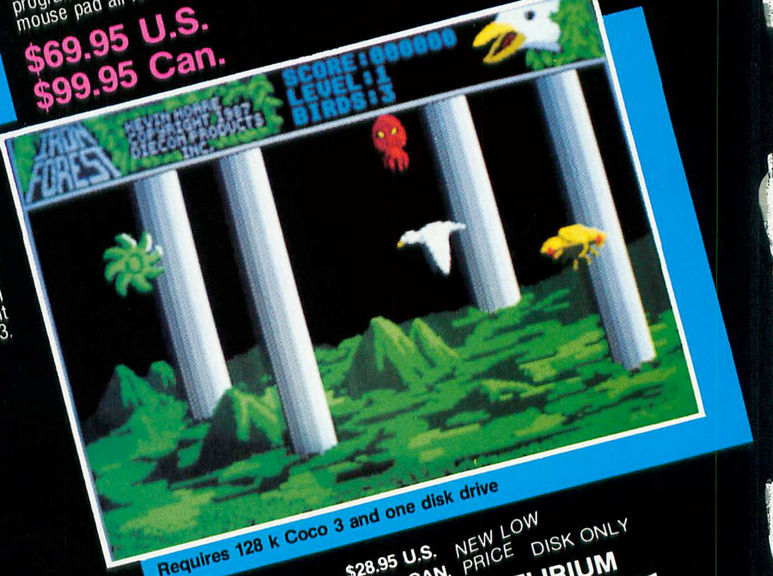

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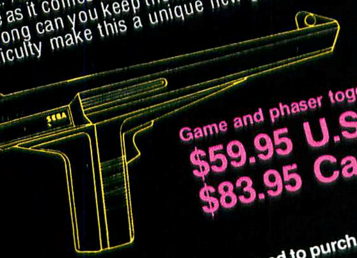

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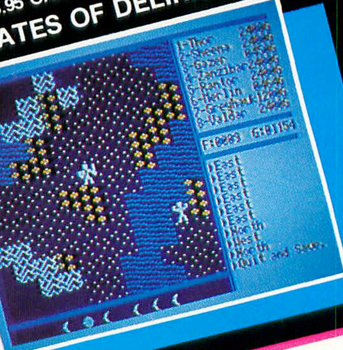

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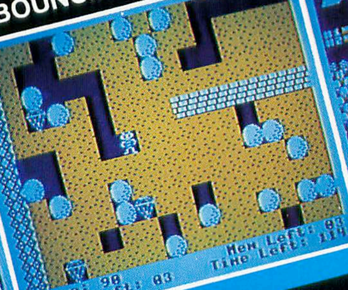

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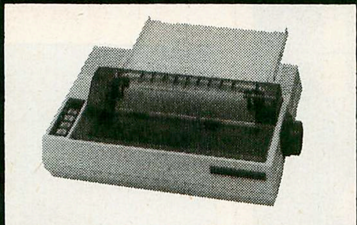

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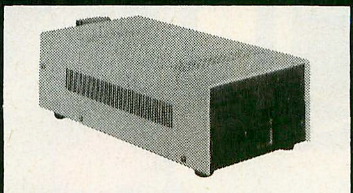

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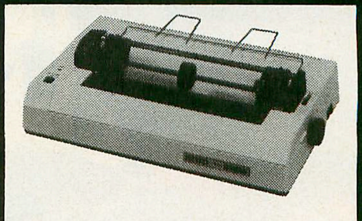

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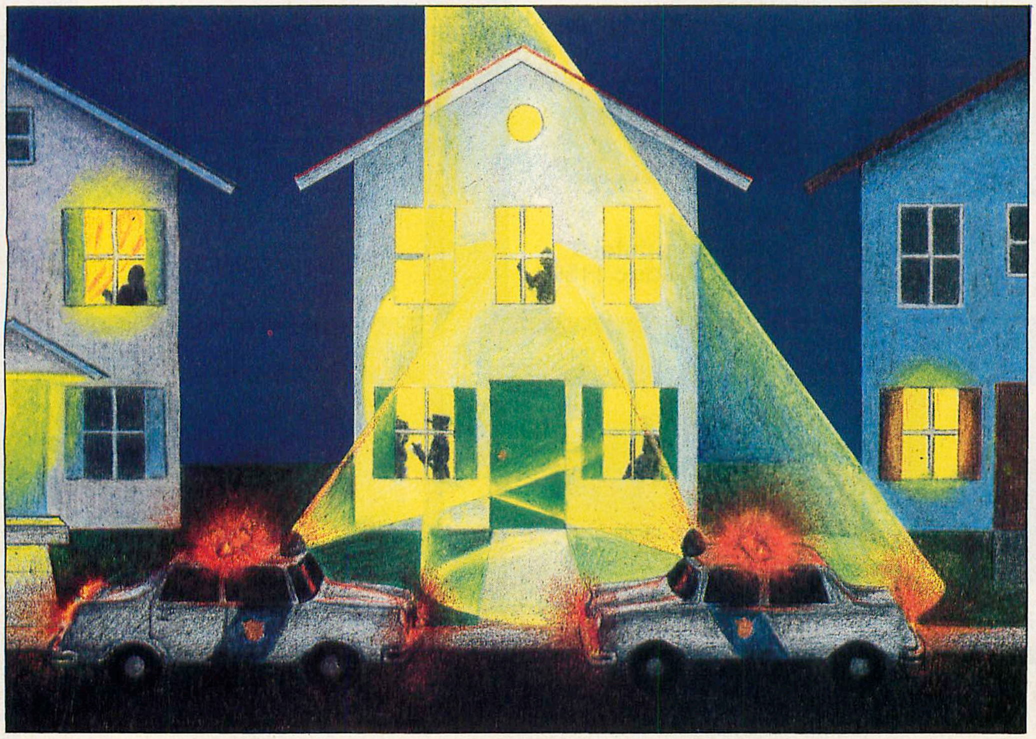

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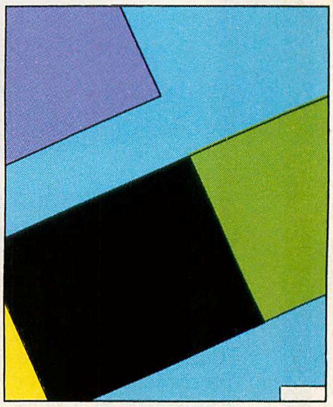

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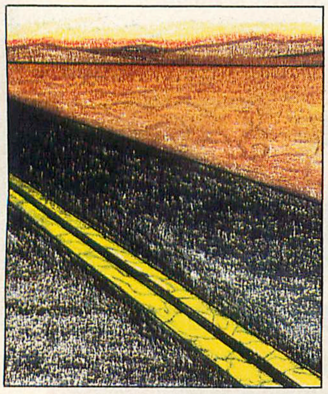

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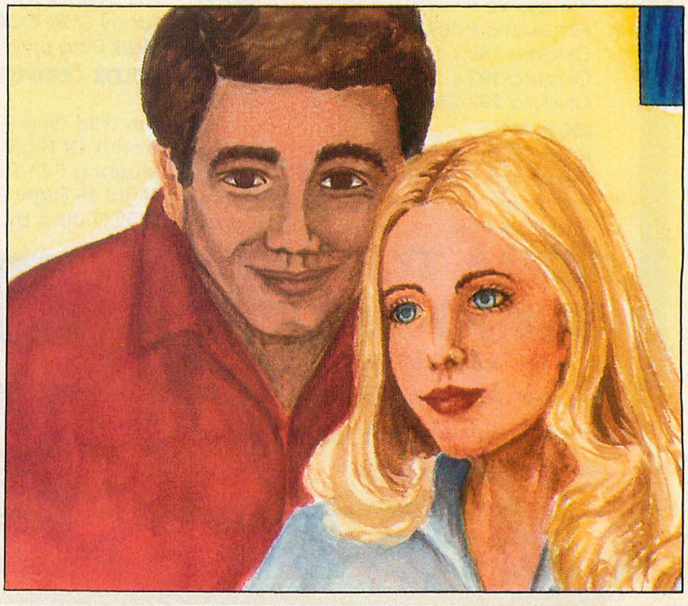

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# Letters to the RAINBOW

### Incentive to Upgrade

*Editor:*

I have been a fairly regular reader of THE RAINBOW since May of 1986, just a month or two after buying a 16K CoCo 2. I have since "graduated" to a CoCo 3 (128K) and added a printer. Hopefully, I'll be adding a disk drive next month. (I've been ordering hardware and software from advertisers in THE RAINBOW, with excellent results!)

I want to commend all of your staff for a most helpful magazine! I save each issue, as I want to be able to refer to articles and programs from time to time. For example, when I first started reading it, I could not use any program that required more than 16K standard BASIC (with cassette file storage only). So when I acquired my CoCo 3, I had a large assortment of "brand new" programs to type in! This situation will repeat itself, obviously, when I have a disk drive! So, I don't get discouraged when a program I especially like is beyond my present system capabilities — it just gives me added incentive to upgrade! Hopefully, other readers feel the same way.

One thing that has caused me some concern is Radio Shack's dropping of some CoCo accessories — the CCR-82 cassette recorder, the S/S cartridge and the RS-232 Program Pak (for communications) come to mind. The RS-232 Pak is the easiest way (for me) to connect my Modemfone 100 to the CoCo — although I have made an adapter to connect it directly to the serial port. I have had lots of fun with the Sound/Speech cartridge in connection with Fred Scerbo's programs in "The Wishing Well." I hope that there will be enough such programs in the future to make Radio Shack consider restoring that accessory to its catalogs. Perhaps if enough of us RAINBOW readers (and other CoCo users!) contacted Radio Shack about the various discontinued items, Radio Shack would at least consider making them once again available.

*Bill Swartz*
*Washington, D.C.*

### Controlling the Controller

*Editor:*

I recently purchased an appliance and light controller for the Color Computer from Radio Shack. Although it is by far the most versatile way I have found of controlling many electrical devices, I am slightly disappointed in the lack of documentation, which significantly limits its potential uses. The instructions for the device describe only manual operation of the controller or manually programmed operation of the controller through its ROM cartridge program.

Obviously, automatic operation of the controller by a user-developed program is also possible. Possible applications might include security systems, control systems, or use as a very inexpensive system clock. It would also be convenient to know how to fully access the controller's memory so that programmed information can be printed out or automatically altered by the computer as the amount of daylight throughout the year changes.

I have had no luck finding information describing the format for direct communication with the controller, nor have I found any information regarding the ROM cartridge subroutines that can be accessed to carry out communications and operating functions with the controller. Does anyone know where to obtain this information? Perhaps an article on the subject would be of interest to other readers, as well.

*Gary L. Beatty*
*Hookstown, PA*

*4,600 of these controllers were given away at the recent Princeton RAINBOWfest, so it shouldn't be long before readers start submitting such articles to* THE RAINBOW.
*How 'bout it, folks?*

### REVIEWING REVIEWS

*Editor:*

I wish to thank Kerry Armstrong for his January 1988 review of *Kung-Fu Dude*, but there is one modification that has since been made, which I want to be known. *Kung-Fu Dude* has been patched to now allow colors on the RGB monitor. This means that no longer will you get the black-and-white stripes on your Tandy CM-8 monitor. All new orders shipped will have this patch, but those who have the older version and want to upgrade can do so by sending their disk, a copy of their receipt and $5 (including shipping) to cover expenses, to Sundog Systems. Thank you.

*Glen R. Dahlgren*
*President*
*Sundog Systems*

### ADOS-3 Version 1.00

*Editor:*

Recently I received reports of incompatibilities between SpectroSystems' ADOS-3 Version 1.00 and two games for the CoCo 3: *Pyramix* (Dr. Preble's Programs) and *The Wild West* (Novasoft). In both cases, the programs would begin to load, then there would be banging of the drive head, then a message claiming "This is a backup copy" would appear. As I am quite proud of ADOS-3's virtual 100 percent compatibility record with commercial software, I was concerned about these reports. Upon investigation, it developed that both games were protected by Sugar Software's *Piratector* copy protection scheme, and that some rather exotic disk operations performed by *Piratector* conflicted with ADOS-3's fix for the head-banging bug in Disk BASIC.

Fortunately, a simple fix for "Piratected" programs is available that will allow them to be used under ADOS-3 Version 1.00. The fix consists of a line that must be added to the BASIC program that `LOADM`s the main file, to be placed immediately before the `LOADM` statement. This line is as follows:

```
IF PEEK(&HD809) = &H2A THEN
POKE &HD809,&H20
```

If the main file is normally `LOADM`ed directly, as with *The Wild West*, place a BASIC program on the disk consisting of the above line followed by the `LOADM` of the main file, and run this program instead of using `LOADM`.

I also suggest that ADOS-3 users add another line to this BASIC loader program, consisting of the ADOS-3 command `FAST`. I have found that loading time of "Piratected" programs is cut by about 2/3 when the `FAST` (2 MHz) processor speed is used. (ADOS-3's disk I/O routines support 2 MHz disk operations, which are normally unreliable under standard Disk BASIC.)

I have passed along this information to the distributors of the two games mentioned above, and hope that they and other software vendors who are using *Piratector* will add the above fix to the commercial versions of their "Piratected" programs. (It will not affect compatibility with non-ADOS-3 systems.) I also expect shortly to make a minor revision to ADOS-3 so that new copies designated as Version 1.01 will be compatible with unmodified "Piratected" programs.

*Arthur J. Flexer*
*Owner, SpectroSystems*
*and author of ADOS*

### HINTS AND TIPS

*Editor:*

One of your readers, Myrtis F. Trexler, requested my assistance to add a feature to my program, *Christmas List* ("Making a Christmas Address List," December 1987, Page 66).

I was asked how to make the left-hand margin greater for the purpose of printing envelopes. If Line 235 is added and Line 270 changed, the printer will print at `TAB (T)` where `T` is the desired left-hand margin.

```
235 INPUT"HOW MANY SPACES FOR
LEFT MARGIN";T

270 PRINT#-2,PRINT#-2,TAB(T);
N$(A):PRINT#-2,TAB(T);A$(A):
PRINT#-2,TAB(T);C$(A);", ";
S$(A):PRINT#-2,TAB(T);Z$(A);
PRINT#-2
```

This may be used for labels, envelopes or form letters with the appropriate value for `T`. For letters and/or envelopes where there is no width restriction, the ZIP code may be

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Please hire the mentally retarded. They are sincere, hard working and appreciative. *Thanks!*
*Phyllis.*

Editing is super simple with the cursor. Find strings instantly too! Insert printer control codes. Specify page size and margins. Switch quickly between word processing and intelligent terminal action. Create text, correct your typing errors; then connect to the other computer, upload your text or files, download information, file it, and sign-off; then edit the receive data, print it in an attractive format, and/or save it on file. Compatible with TELEWRITER.

CASSETTE $29.95
DISKETTE $39.95
Add $3 shipping and handling
MC/VISA/C.O.D.

Advanced system of keystroke macros lets you automate any activity, such as dial via modem, sign-on, interact, sign-off, print, save. Perform entire session. Act as message taker. At start-up, disk version can automatically set parameters, dial, sign-on, interact, read/write disk, sign-off, etc. Timed execution lets AUTOTERM work while you sleep or play. No other computer can match your COCO's intelligence as a terminal.

PXE Computing
11 Vicksburg Lane
Richardson, Texas 75080
214/699-7273

placed on the *city, state* line by changing Line 270 as follows:

```
270 PRINT#-2:PRINT#-2,TAB(T);
N$(A):PRINT#-2,TAB(T);A$(A):
PRINT#-2,TAB(T);C$;", ";S$;"
";Z$:PRINT#-2;PRINT#-2
```

These changes may be of interest to others.

*George F. Saunderson*
*Houston, TX*

### *Calendar* Modifications

*Editor:*

I am submitting some changes I have incorporated in William Holdorf's calendar program ("Appointment Calendar," January 1988, Page 100), which may be of interest to other readers. The following lines are additions and/or changes I have made:

```
900 POKE 359,57:POKE65314,85
1355 POKE282,0
1395 POKE282,255
1380 IF AN$="End" THEN 1430
1390 IF AN$="Skip" THEN 1530
1530 POKE282,255:CLS5
2290 PRINT#-2,CHR$(27);
CHR$(16);CHR$(2);CHR$(160);
```

Line 2290 is changed for use with the DMP-105 printer.

The first four screens can be edited to upper- and lowercase as desired for true lowercase printing.

*R.M. (Bob) Drost*
*Dawson Creek, British Columbia*

### Pump Up the Volume

*Editor:*

I have modified *Airplane* ("CoCo's Daring Flying Machine," January 1988, Page 73) to make it more realistic. I thought that demonstrating just the graphics capabilities of our beloved CoCo is not enough, so I added sound effects in these lines:

```
330 DRAW "A0"+P$:EXEC 43345
350 DRAW "A1"+P$:EXEC 43345
370 DRAW "A2"+P$:EXEC 43345
390 DRAW "A3"+P$:EXEC 43345
```

Take note that deleting the `43345`s in lines 350, 370 and 390 will prevent the modification from working. You will get longer sounds if you do not specify what you are `EXEC`uting. Another tip is to use a `POKE 140,x` before the four modified lines, where x is any value from 1 to 255.

*Werner Daniel Streidt*
*Cairo, Egypt*

### UV Light Protection

*Editor:*

Dr. Larry Preble should be commended for his most informative article on "the hazards of spending long hours at the computer" ("A Healthy Interface," February 1988, Page 118). I want all your glasses-wearing readers to know of an extraordinarily effective aid in protecting one's eyes from computer-related fatigue. To a significant degree, eye strain is caused by accumulated exposure to ultraviolet light emitted by television sets and monitors. Computer users who wear glasses can have an invisible, permanent coating sprayed on their lenses to deflect this ultraviolet radiation, thereby greatly reducing eye irritation and discomfort. This service is provided by your local optometrist or vision care center. The cost is $10 to $15 and requires only a few minutes' time for the entire process.

*David Mills*
*(DAVIDMILLS)*
*Huntington, WV*

### INFO PLEASE

*Editor:*

I have been trying to contact Hemphill Electronics, but have had no luck. Have they moved, gone out of business, or what?

*Kyle Hagaward*
*Los Angeles, CA*

*Hemphill Electronic's new address is 334 Paseo Tesoro, Walnut, CA 91789, (717) 598-7799.*

### KUDOS

*Editor:*

I'd like to take this opportunity to rave about one of your article writers, Nancy Ewart. I am sure I, like many others, got more from her "Stalking the Fire-Breathing Dragon" OS-9 dissertation (January 1988, Page 156) than from any other source. An example is her explanation of creating a 40-track, double-sided system disk using `DSave`. God only knows the hours I've spent with the manuals, other articles and OS-9 bibles trying to accomplish what she explained in one paragraph plus the clarity of her printed command: `dsave(space)-b(space)/d0(space)/d1(space)!(space)shell`. We need more articles from this very proficient writer who knows how to take the fog-level out of difficult subjects. Tandy's writers and most of the other experts writing tech-info should take lessons from Nancy. Let us have more articles from this lady who gets stars from me on her report card!

*Michael Bernardi*
*Sarasota, FL*

### Monitor Madness

*Editor:*

I just want to thank you guys. I was about to buy a monitor for my new CoCo 3 when the model number sparked my memory. Turning to a back issue, I discovered that the model I was about to buy, the Motorola 8CM562, wouldn't work. If it hadn't been for your magazine and one line in an article on monitors, I would have made a $300 mistake. Again, thanks.

*Paul R. Broshear*
*(GROUCHY)*
*San Angelo, TX*

## PEN PALS

- I'm 17 years old. I have a CoCo 3 and a disk drive, printer, cassette recorder and modem. I'm looking for pen pals, whatever their system, age or country.

*Ana M. Rodriguez*
*D #F-17 Torremolinos*
*Guaynabo, PR 00657*

- My address has changed, but I still want pen pals!

*Norman L. Morris, Jr.*
*7743 S. Paulina*
*Chicago, IL 60620*

- I would like to have some pen pals. I am 16 years old and own a 64K CoCo, a printer and a disk drive.

*Bosman Andreas*
*Hoge Burg 52*
*9371 Dendebelle*
*Lebbeke*
*Belgium*

- I am a late 40's single mother who would enjoy other single pen pals of my age bracket. I own a CoCo 2 and a 512K CoCo 3 with monitor and cassette, two disk drives, a CGP 115 and 220, a DMP-130 and a modem. I also speak French.

*Nicole Pouliot Coors*
*5059 Chauntecleer Ct.*
*Mobile, AL 36693*

- I live in a small town about 40 miles north of Atlanta. I have a CoCo 3, FD-501 disk drive, CM-8 color monitor, DMP-106 printer, CCR-81 recorder and deluxe joysticks. I wish to correspond with all CoCoers. I have had my CoCo for only four months and am just getting to know it. I would appreciate any pointers anyone might have in respect to graphics and animation. I will respond to any and all letters.

*Mike Tracey*
*1220 Sherry Drive*
*Alpharetta, GA 30201*

- I am a young 38-year-old stained glass artist and game, Adventure and utility fanatic. I have a CoCo 2, Epson RX-80 printer, two drives and Multi-Pak, etc. I'll answer everyone and would especially like people who can talk to my printer as I cannot. Write soon.

*Kim Sinrod*
*16 Scranton Ave.*
*Lynbrook, NY 11563*

- I am 34 years old and am looking for pen pals from the U.S.A. and around the world. I have a Color Computer 2 with 64K, and a Multi-Pak Interface. I also have two disk drives, a cassette recorder and a DMP-430 printer.

*Paul Nelson Dolliver*
*115 Peach St.*
*Snyder, TX 79549*

- I am 19 years old and have a 128K CoCo 3, a 64K CoCo 2, disk drive, Multi-Pak, DMP-105 printer and a DCM-3 modem. I am looking for pen pals from the United States and Canada.

*J.M. Whynot*
*P.O. Box 50*
*Port Medway, Nova Scotia*
*Canada B0J 2T0*

- I am 18 years old and would like to pen pal with anyone in the world. I have a CoCo 2, FD 501 drive, CCR-81 recorder, DMP-105 printer, and I am going to buy a CoCo 3 in the near future.

*Tito Voysest*
*Malecon Cisneros 124 DPTO 902*
*Lima, Peru*

## BULLETIN BOARD SYSTEMS

- There is a new BBS in southeastern Kentucky. It includes Xmodem downloading and uploading, a peek and pokes section, online games and more. Online from 10 p.m. to 8 a.m. Call (606) 439-1853.

*Kenny Napier*
*P.O. Box 387*
*Bulan, KY 41722*

- Call the Grand Rapids BBS Wyoming Pubb, (616) 538-8229. The BBS operates under the OS-9 and UNIX operating systems on a CoCo 2 with 512K RAM.

*Robert M. Worth, Jr.*
*1726 Millbank S.E.*
*Grand Rapids, MI 49508*

- You are cordially invited to call The Highlandtown International Airport BBS at (301) 675-7626 (300/1200-7/E/1). Online and open for incoming flights since June 1, 1986, running highly modified *Colorama* BBS software. Instant access after filling out the new-user application. A donation is required for higher access.

*Tim Krahling, SysOp*
*2930 E. Fayette St.*
*Baltimore, MD 21224*

- The Franklin County Data Center has changed its online operating hours. We operate from 10 p.m. to 7 a.m., seven days a week. Call (703) 365-2018 at 300 baud, 7-E-1 or 8-N-1.

*Ricky Sutphin*
*Rt. 1, Box 20*
*Henry, VA 24102*

- There's a new CoCo BBS in Connecticut, "Strictly CoCo," running at 300/1200 baud, operating 24 hours a day, seven days a week. Running on a CoCo 2 with four disk drives under *CoBBS* with Xmodem upload/download file section and expanding message bases. Call (203) 378-1572 with 8/N/1.

*Tom Cowley (SysOp)*
*445 Stonybrook Road*
*Stratford, CT 06497*

- Omega BBS of Cincinnati is now online with *TuBBS 2.4* software, running on a CoCo 3. We support the CoCo with downloads, online games, multiple message bases and 24-hour operation. Call (513) 671-2049, 300/1200 baud, 8/N/1 protocol.

*Thomas Altum*
*1746 Continental*
*Shatconville, OH 45246*

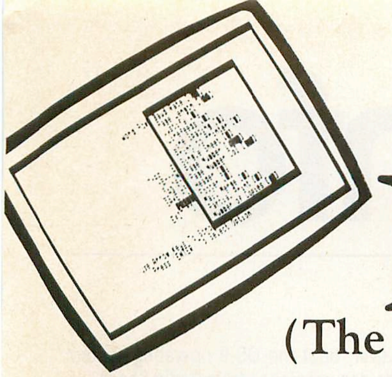
- I operate a bulletin board for the Canadian Forces Base (CFB) Summerside Computer Club.

The C.F.B. Summerside BBS is online at (902) 436-2281; ask for Local 583. The system runs on the club's Model III with multiple drives. The system features Xmodem up/downloads for all computers, five messages bases, information, and soon, online games. Parameters are 8-N-1, 300 baud, and the system is up 24 hours, seven days a week. There is no charge, and new users instantly receive access. SysOps are John Cunningham and Philippe Comeau.

*John Cunningham*
*10 Glover's Shore Road*
*Summerside, P.E.I.,*
*Canada C1N 4G4*

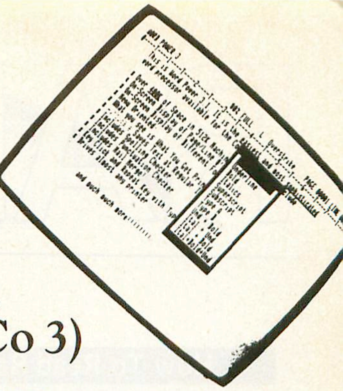
**THE RAINBOW welcomes letters to the editor. Mail should be addressed to: Letters to Rainbow, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. Letters should include the writer's full name and address. Letters may be edited for purposes of clarity or to conserve space.**

**Letters to the editor may also be sent to us through our Delphi CoCo SIG. From the CoCo SIG> prompt, type `RAI` to take you into the Rainbow Magazine Services area of the SIG. At the RAINBOW> prompt, type `LET` to reach the LETTERS> prompt and then select Letters for Publication. Be sure to include your complete name and address.**



# Word Power 3.1

## (The Ultimate Word Processor for the CoCo 3)



**Power Unleashed!** Unlike other word-processors, Word Power 3.1 is written from scratch for the CoCo 3. It bridges the gap between "what is" and "what should be" in word-processors. **No other word processor offers such a wide array of features that are so easy to learn and use.**

### DISPLAY

The **80-column display** with true lowercase lets you view the full width of a standard page. **All prompts are displayed in plain English in neat colored windows (see display above).** The current column number, line number, page number and percentage of free memory is displayed on the screen at all times. The program even **displays the bottom margin perforation** so you know where one page ends and the other begins. You can also change foreground/background color of screen and select menu and carriage return colors to suit your needs! Carriage returns can be visible or invisible. Word Power 3.1 runs at double clock speed and can be used with RGB/composite/monochrome monitors as well as TV.

### AVAILABLE MEMORY

No other word processor gives you so much memory. Word Power 3.1 gives you **over 72K** on a 128K machine and **over 450K** on a 512K machine to store text.

### EDITING FEATURES

Word Power 3.1 has one of the **most powerful and user-friendly full-screen editors with word-wrap.** All you do is type. Word Power 3.1 takes care of the text arrangement. It even has a built-in **Auto-Save** feature which saves the current text to disk at regular intervals; so you know that your latest version is saved to disk. Here are some of the impressive editing features of Word Power 3.1:

Insert/Overstrike Mode (Cursor style changes to indicate mode); OOPS recall during delete; **Type-ahead buffer** for fast typers; Key-repeat (adjustable) and Key-click; Four-way cursor control and scrolling; Cursor to beginning of text, end of text, beginning of line, end of line, top/bottom of screen, next/previous word; Page up/down; Delete character, previous/next word, beginning/end of line, complete line, text before and after cursor; Locate/Replace with **wild-card search** with auto/manual replace; Block Mark, Unmark, Copy, Move and Delete; Line Positioning (Left/Center/Right); Set/Reset 120 programmable tab stops; Word count. Define left, right, top and bottom margins and page length. You can also highlight text (underline — with **on-screen underlining,** bold, italics, superscripts, etc). Word Power 3.1 even has a **HELP screen** which can be accessed any time during edit.

### MAIL-MERGE

Ever try mailing out the same letter to 50 different people or sending out several resumes? Could be quite a chore. Not with Word Power 3.1. Using this feature, you can type a letter, follow it with a list of addresses and have Word Power 3.1 print out personalized letters. It's that easy!

### SAVING/LOADING TEXT

Word Power 3.1 creates ASCII format files which are compatible with almost all terminal, spell-checking and other word-processing programs. It allows you to load, save, append and kill files and also to create and edit Basic, Pascal, C and Assembly files. You can select files by simply cursoring through the disk directory. Supports double-sided drives and various step rates.

### PRINTING

Word Power 3.1 drives almost any printer (DMP series, EPSON, GEMINI, OKIDATA, etc). Allows print options such as baud rates, line spacing, page pause, partial print, page numbers, page number placement, linefeed option, multi-line headers/footers, right justification and number of copies (see display above). The values for these parameters and the margins can be changed anytime in the text by embedding Printer Option Codes. Word Power 3.1 has the **WHAT YOU SEE IS WHAT YOU GET** feature which allows you to preview the text on the screen as it will appear in print. You can see margins, page breaks, justification and more.

### SPELLING CHECKER

Word Power 3.1 comes with a 50,000 word spelling checker/dictionary which finds and corrects mistakes within your text. You can add words to or delete from the dictionary or create a dictionary of your own.

### PUNCTUATION CHECKER

This checker will **proofread your text for punctuation errors** such as capitalization, spaces after periods/commas, double words and much more. It's the perfect addition to any word processor.

### DOCUMENTATION

Writing with Word Power 3.1 is a breeze. Word Power 3.1 comes with a well-written, easy-to-comprehend instruction manual which will lead you step-by-step through the program.

Word Power 3.1 comes on an UNPROTECTED disk and is compatible with RS DOS 1.0/1.1 and ADOS. Only $79.95.

(Word Power 3 owners can get the 3.1 version by sending proof of purchase and $10.00 to cover the cost of shipping and the manual.)

MICROCOM SOFTWARE
P.O. Box 214
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# RAINBOW Info

## How To Read Rainbow

Please note that all the BASIC program listings in THE RAINBOW are formatted for a 32-character screen — so they show up just as they do on your CoCo screen. One easy way to check on the accuracy of your typing is to compare what character "goes under" what. If the characters match — and your line endings come out the same — you have a pretty good way of knowing that your typing is accurate.

We also have "key boxes" to show you the *minimum* system a program needs. But, *do* read the text before you start typing.

Finally, the little disk and/or cassette symbols on the table of contents and at the beginning of articles indicate that the program is available through our RAINBOW ON DISK or RAINBOW ON TAPE service. An order form for these services is on the insert card bound in the magazine.

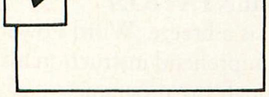
## What's A CoCo?

CoCo is an affectionate name that was first given to the Tandy Color Computer by its many fans, users and owners.

However, when we use the term CoCo, we refer to both the Tandy Color Computer and the TDP System-100 Computer. (While many TDP-100s are still in service, the TDP Electronics division of Tandy no longer markets the CoCo look-alike.) It is easier than using both of the "given" names throughout THE RAINBOW.

In most cases, when a specific computer is mentioned, the application is for that specific computer. However, since the TDP System-100 and Tandy Color are, for all purposes, the same computer in a different case, these terms are almost always interchangeable.

## Rainbow Check Plus



The small box accompanying a program listing in THE RAINBOW is a "check sum" system, which is designed to help you type in programs accurately.

*Rainbow Check PLUS* counts the number and values of characters you type in. You can then compare the number you get to those printed in THE RAINBOW. On longer programs, some benchmark lines are given. When you reach the end of one of those lines with your typing, simply check to see if the numbers match.

To use *Rainbow Check PLUS*, type in the program and save it for later use, then type in the command RUN and press ENTER. Once the program has run, type NEW and press ENTER to remove it from the area where the program you're typing in will go.

Now, while keying in a listing from THE RAINBOW, whenever you press the down arrow key, your CoCo gives the check sum based on the length and content of the program in memory. This is to check against the numbers printed in THE RAINBOW. If your number is different, check the listing carefully to be sure you typed in the correct BASIC program code. For more details on this helpful utility, refer to H. Allen Curtis' article on Page 21 of the February 1984 RAINBOW.

Since *Rainbow Check PLUS* counts spaces and punctuation, be sure to type in the listing exactly the way it's given in the magazine.

```
10 CLS:X=256*PEEK(35)+178
20 CLEAR 25,X-1
30 X=256*PEEK (35)+178
40 FOR Z=X TO X+77
50 READ Y:W=W+Y:PRINT Z,Y;W
60 POKE Z,Y:NEXT
70 IFW=7985THEN80ELSEPRINT
   "DATA ERROR":STOP
80 EXEC X:END
90 DATA 182, 1, 106, 167, 140, 60, 134
100 DATA 126, 183, 1, 106, 190, 1, 107
110 DATA 175, 140, 50, 48, 140, 4, 191
120 DATA 1, 107, 57, 129, 10, 38, 38
130 DATA 52, 22, 79, 158, 25, 230, 129
140 DATA 39, 12, 171, 128, 171, 128
150 DATA 230, 132, 38, 250, 48, 1, 32
160 DATA 240, 183, 2, 222, 48, 140, 14
170 DATA 159, 166, 166, 132, 28, 254
180 DATA 189, 173, 198, 53, 22, 126, 0
190 DATA 0, 135, 255, 134, 40, 55
200 DATA 51, 52, 41, 0
```

## OS-9 and RAINBOW ON DISK

The OS-9 side of RAINBOW ON DISK contains two directories: CMDS and SOURCE. It also contains a file, `read.me.first`, which explains the division of the two directories. The CMDS directory contains executable programs and the SOURCE directory contains the ASCII source code for these programs. BASIC09 programs will only be offered in source form so they will only be found in the SOURCE directory.

OS-9 is a very powerful operating system. Because of this, it is not easy to learn at first. However, while we can give specific instructions for using the OS-9 programs, you will find that the OS-9 programs will be of little use unless you are familiar with the operating system. For this reason, if you haven't "learned" OS-9 or are not comfortable with it, we suggest you read *The Complete Rainbow Guide to OS-9* by Dale Puckett and Peter Dibble.

The following is not intended as a course in OS-9. It merely states how to get the OS-9 programs from RAINBOW ON DISK to your OS-9 system disk. Use the procedures appropriate for your system. Before doing so, however, boot the OS-9 operating system according to the documentation from Radio Shack.

1) Type `load dir list copy` and press ENTER.
2) If you have only one disk drive, remove the OS-9 system disk from Drive 0 and replace it with the OS-9 side of RAINBOW ON DISK. Then type `chd/d0` and press ENTER. If you have two disk drives, leave the sytem master in Drive 0 and put the RAINBOW ON DISK in Drive 1. Then type `chd/d1` and press ENTER.
3) List the `read.me.first` file to the screen by typing `list read.me.first` and pressing ENTER.
4) Entering `dir` will give you a directory of the OS-9 side of RAINBOW ON DISK. To see what programs are in the CMDS directory, enter `dir cmds`. Follow a similar method to see what source files are in the SOURCE directory.
5) When you find a program you want to use, copy it to the CMDS directory on your system disk with one of the following commands:

One-drive system: `copy /d0/cmds/`*filename* `/d0/cmds/`*filename* `-s`

The system will prompt you to alternately place the source disk (RAINBOW ON DISK) or the destination disk (system disk) in Drive 0.

Two-drive system: `copy /d1/cmds/`*filename* `/d0/cmds/`*filename*

Once you have copied the program, you execute it from your system master by placing that disk in Drive 0 and entering the name of the file.

## The Rainbow Seal

RAINBOW
CERTIFICATION
SEAL

*The Rainbow Certification Seal* is our way of helping you, the consumer. The purpose of the Seal is to certify to you that any product that carries the Seal has actually been seen by us, that it does, indeed, exist and that we have a sample copy here at THE RAINBOW.

Manufacturers of products — hardware, software and firmware — are encouraged by us to submit their products to THE RAINBOW for certification. We ascertain that their products are, in actuality, what they purport to be and, upon such determination, award a Seal.

The Seal, however, is not a "guarantee of satisfaction." The certification process is different from the review process. You are encouraged to read our reviews to determine whether the product is right for your needs.

There is absolutely no relationship between advertising in THE RAINBOW and the certification process. Certification is open and available to any product pertaining to CoCo. A Seal will be awarded to any commercial product, regardless of whether the firm advertises or not.

We will appreciate knowing of instances of violation of Seal use.

# COCO 3 UTILITIES GALORE

(All utilities support 40/80 columns for CoCo 3)
(CoCo 2 versions are available for most utilities)

## SUPER TAPE/DISK TRANSFER

● Disk-to-Disk Copy (1-3 passes) ● Tape-to-Disk Copy ● Tape-to-Disk Automatic Relocate ● Disk-to-Tape Copy ● Tape-to-Tape Copy
Copies Basic/ML programs and DATA files. CoCo 1, 2 & 3. 32 K Disk System (Disk to Disk Copy requires 64 K). Disk Only **$24.95**

## OS9 LEVEL II RAMDISK

Lightning Fast Ramdisk with Auto Formatting. A must for any OS9 Level II User. Req. 512 K **$29.95.** (Only $14.95 with the purchase of 512 K Upgrade & Ramdisk!!).

## HI-RES JOYSTICK SOFTWARE

Wish you could use the hi-res joystick interface from Basic? You can now. This program will let you access 640 x 640 pixels from your joystick for extra precision. CoCo 3 Disk **$14.95**

## COCO NEWSROOM

Now available for the CoCo III! You can design your own newspaper with Banner Headlines/6 articles using sophisticated Graphics, Fonts and Fill Patterns. Comes with 22 fonts & 50 pictures! Over 140 K of code. Disk only **$49.95**

## MAILLIST PRO

The ultimate mailing list program. Allows you to add, edit, view, delete, change, sort (by zipcode or name) and print labels. Its indispensible! Disk Only **$19.95** (CoCo 2 version included)

## DISK LABEL MAKER

Allows you to design professional disk labels! Allows elongated, normal and condensed format for text, double-strike, border creation and multiple-label printing. Its a MUST for any user with a disk drive. Disk Only **$19.95.** Supports DMP 105/110/120/130/430, GEMINI, STAR, EPSON and compatibles. (CoCo 2 version included)

## COMPUTERIZED CHECKBOOK

Why bother with balancing your checkbook? Let the CoCo do it for you! Allows you to add, view, search, edit, change, delete and printout (in a table or individual entry format) checkbook entries. Updates balance after each entry. Allows files for checking, saving and other accounts. Disk Only **$19.95** (CoCo 2 version included)

## BOWLING SCORE KEEPER

An excellent utility to keep track of your bowling scores. Allows you to save scores under individuals or teams. You can edit, change, delete and compare scores. A must for anyone who wants to keep track of his or her bowling performance. Disk **$19.95** (CoCo 2 version included).

## VCR TAPE ORGANIZER

Organize your videocassettes with this program! Allows you to index cassettes by title, rating, type, play time and comments. Also allows you to sort titles alphabetically and view/print selected tapes. If you own a VCR, this program is a must. Disk Only **$19.95** (CoCo 2 version included).

## SCREEN DUMP

NEW

32, 40, 80 column text dump, PMODE 4 Graphics Dump. Single Keystroke Operation allows you to take snapshots of screens even when programs are running! Works on DMP's, Epson and Gemini. CoCo 1, 2 and 3. Disk Only **$24.95**

## HOME BILL MANAGER

NEW

Let the CoCo keep track of your bills. Allows you to enter bills under various categories and reminds you when they are due. Disk Only. **$19.95**

## CALENDAR MAKER

NEW

Generate monthly calendars on your printer for any year in the 20th century. Disk Only. **$19.95**

## COCO UTIL II

(Latest Version): Transfer CoCo Disk files to IBM compatible computer. Transfer MS-DOS files to CoCo. Req. 2-Drive IBM compatible. **$39.95**

## SPIT 'N IMAGE

Makes a BACKUP of ANY disk **$32.95**

## ADOS3

Advanced Disk Operating System for CoCo 3. **$34.95 ADOS $27.95**

## RGB PATCH

Displays most games in color on RGB monitors. For CoCo 3 Disk **$24.95**

# OS 9 PRODUCTS

## OS 9 LEVEL II OPERATING SYSTEM

NEW

Supports 512K RAM dual speed, multi-tasking, multiple windows and more! Comes with disk and complete documentation. Only **$89.95**

## MULTI-VUE

User friendly graphics interface with multiple "window" applications for Level II. Only **$54.95**

## WIZ

OS9 Level II Terminal Package with 300-19200 baud rate and windowing capability. Requires 512 K and RS-232 Pack. Only **$79.95**

## SCREEN STAR

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# Seasons of Change

There have been some pretty big changes taking place around here in the last month and I thought you would like to know something about them.

First of all, we staged Falsoft's first "retirement" party ever when General Manager Pat Hirsch — who was the company's first paid employee (she got paid even before I did) — was honored at a luncheon the middle of February. Pat's last day was February 15.

Bonnie Frowenfeld, who has been assistant general manager for fulfillment services, has moved into Pat's office. Bonnie brings a wealth of experience to the position and I know you will all join me in wishing her well at her new post.

I know that many of you who have met Pat at RAINBOWfests will also join me in wishing her the best in her "retirement." As an old lady of 45 (it has always been a great source of pleasure to me that she is six full months older than I am), Pat intends to spend more time traveling with her husband to pickle patches around the world and sharpening up her tennis game.

Some explanation is in order for the first statement; a clarification for the second.

"Mr. Pat," Ken Hirsch, is the head honcho at Paramount Foods here in Louisville, a firm that makes and sells pickles, relishes and other stuff like that. Additionally, Ken (known, obviously, as "Pickle" to many of his friends) is an Important Person in the International Pickle Packer's Association and needs to make numerous trips for them as well as his own business. Pat's duties at Falsoft had limited her ability to accompany him. Now they won't. (Incidentally, Pat is *not* known as "Mrs. Pickle." Their eldest daughter, Lisa, however, is known as "Little Pickle.")

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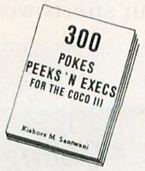

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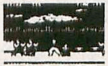

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My second comment, concerning tennis, is probably untrue. If Pat gets much better at tennis than she is, she may be banned from local courts. Her serve broke my secretary's arm one day. Bob Albrecht, the famous writer, once challenged her to a match until he found out how good she was. He backed out.

* * *

Another big change here sees a sort of triple shift, brought about by Jim Reed's decision to "explore new horizons" in the publishing world.

Jim was the first managing editor of RAINBOW and guided it through its important stages of growth and development. His depth of knowledge of magazines and publications was a vital element in its metamorphosis from a "newsletter" to a slick magazine.

Jim moved to other duties about six months ago, as executive editor for the company. Jutta Kapfhammer then moved into the editorial coordinator's job and became managing editor of RAINBOW.

With Jim's departure, Jutta will devote full time to her managing editor's position. John Crawley, who has been with Falsoft for almost five years, becomes director of editorial services. For those of you who wonder, John will also continue as editor of ScoreCARD, our sports weekly.

***"Change means that we are getting new blood, new ideas and looking at new ways to solve problems."***

Jim's departure means we have placed, for now, anyway, our Color Computer history book on the back burner. We may move it back up front at any time, however, so stay tuned.

While Jim will no longer work directly with the magazines, he will continue to oversee our operations on Delphi. So, he'll still be an important part of our CoCo Community.

* * *

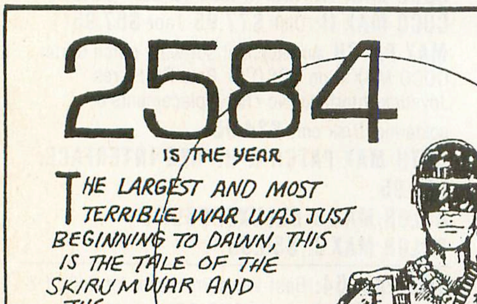
We will miss Pat and Jim, but, despite that, I think change is, essentially, good. Change means that we are getting new blood, new ideas and looking at new ways to solve problems that we didn't have before. This is certainly not to say that the "old" ways didn't work or were no good, it is just that a fresh approach is always a good one.

To that end, I remember a poem that Mrs. Howard, who taught Library at Crestline Grammar School, once made us learn. The essential part of it went:

*Make new friends;*
*But keep the old.*
*One is silver;*
*And the other gold.*

I think it most appropriate to consider those sentiments at this time.

— **Lonnie Falk**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## Corrections (See Page 30 for additional corrections.)

**"Making a Christmas Address List" (December 1987, Page 66):** George Saunderson has written to correct a bug that will cause an AO Error to occur if certain conditions are met when running `XMASLIST`. To correct the problem, re-enter Line 440 as follows:

```
440 NEXT A:GOTO 420
```

**"A Christmas Potpourri" (December 1987, Page 100):** One of the `HDRAW` codes is missing from Line 2460 of `XMASPORI`. That line should be altered as follows:

```
2460 HDRAW"BR10;BU2;XZY$;BR8;BD6
;BD1;XE$;BR9;BU2;XA$;BR3;BD1;XR$
;"
```

**"A Smooth Operator" (January 1988, Page 78):** As written, `SMOOTHY` does not work properly on 512K CoCo 3s. To fix this problem, change the value of 25 in Line 170 to a value of 217. Also, change the value of 24 in Line 220 to a value of 216.

**"Taking Care of CoCo 3 Bugs" (Hint, February 1988, Page 115):** The hint incorrectly states that if a value greater than 23 and less than 127 is given as the vertical coordinate of the `HPRINT` command, the text to be printed will appear on the first screen line. Actually, any value greater than 23 but less than or equal to 127 will cause the message to be printed on the *bottom* line, as it should. When the vertical coordinate is *greater* than 127 and less than or equal to 151, however, the text *will* be printed on the first screen line.

**For quicker reference, Corrections will be posted on Delphi as soon as they are available in the Info on Rainbow topic area of the database. Just type `DATA` at the CoCo SIG> prompt and `INFO` at the TOPIC> prompt.**

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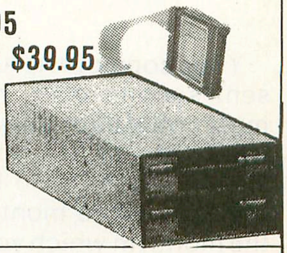

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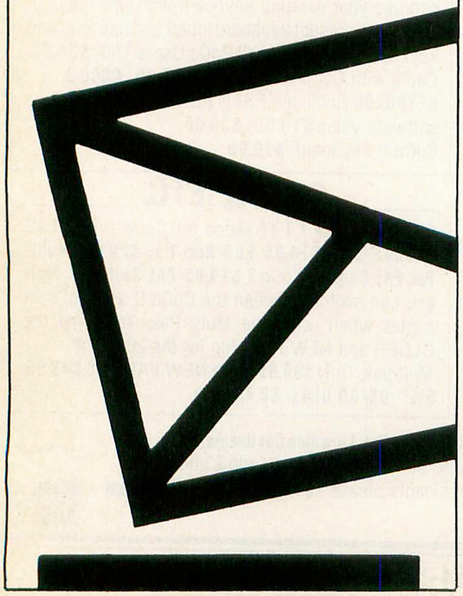


## Building April's Rainbow

# Our favorite "home helper" . . .

# . . . deserves a home of its very own!

As far as I know, home builders are not yet incorporating computer rooms into their house plans, except when a house is custom designed, but Jim Reed insists that architects will soon be sketching in computer rooms in the same routine manner they add utility rooms, breakfast nooks, half baths and sun rooms. I agree. And when that does become commonplace, what do you suppose the "standard" computer room will include, and where will it be?

My first thought is that it would be nice to have the computer room look in on the family room, much as some kitchens are designed so you can look in on family members as you cook, or even follow what they're watching on TV. I guess the computer room's window might need to be closed if you fire up a loud printer or if the family room activity becomes too distracting, but I dislike being separated from the rest of the household when I am computing.

A friend down in Florida is building a house right now, and the computer room is one of his central interests. He is having *three* phone lines put in. One is to be a voice line while the other two are data lines. Two data lines? Well, he says, if he is running a BBS, how else will he be able to access other BBS systems or the online services? Obviously, all of us would have a bunch of electrical outlets, but he also says his computer stuff will be on a completely separate circuit from the rest of the house. He's even having 25-conductor, RS-232 cable run throughout the house with five leads going into the computer room.

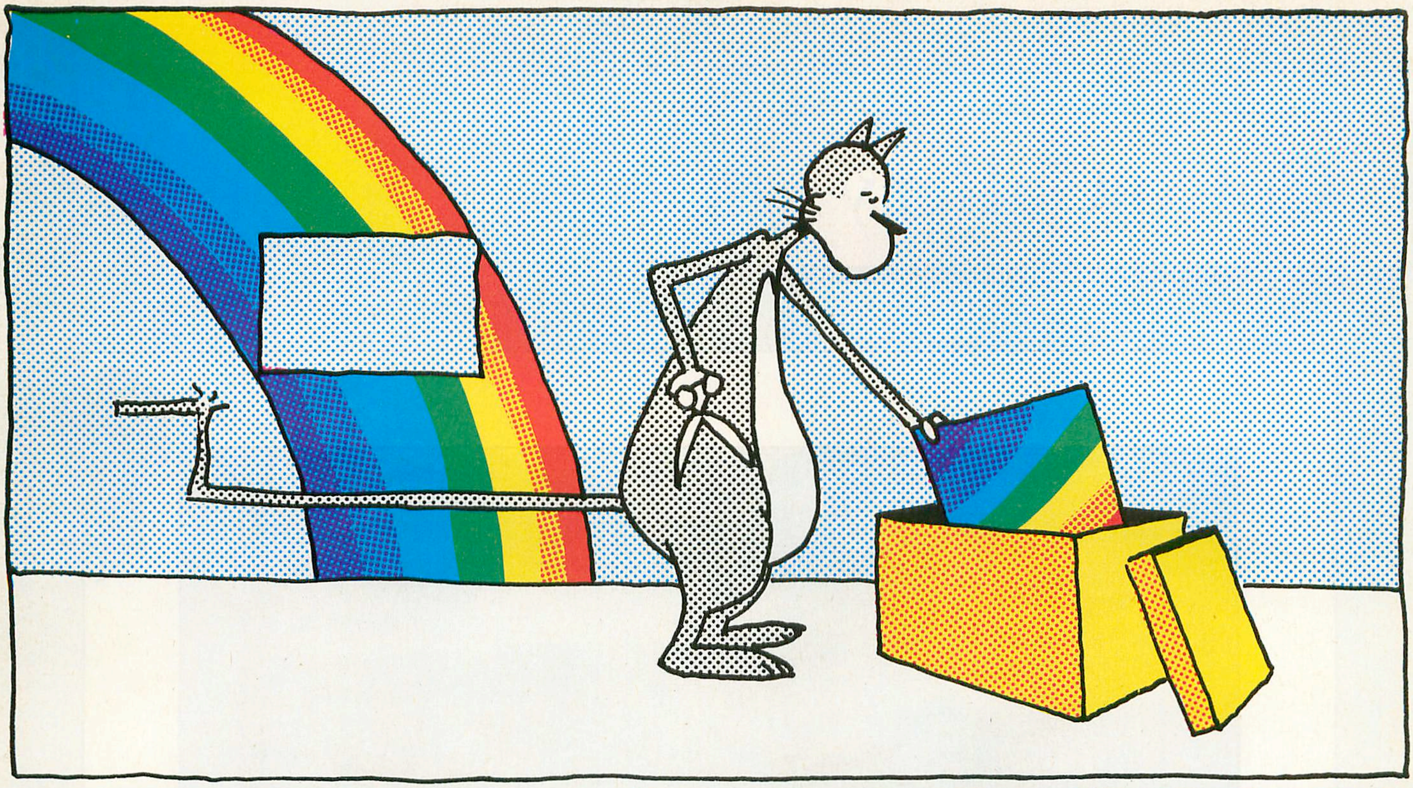
While I'd prefer to stay in touch with family activities, he wants to be in the remotest part of the house. He is also having acoustical insulation installed so any late night tap, tap, tap on the keyboard will not disturb those who think the wee hours are for sleeping.

Regardless of where the room is located, the custom computer room for the home should, I would think, be laid out so that screen reflections from windows, lamps, ceiling fixtures or even other monitors would be minimized. Such things as carpeting, home intercom, shelving (make sure to know where the studs are for later addition of more shelves) and wall decor are, of course, a matter of individual taste. In discussing it around the office, though, a surprising consensus developed that it would be great to have built-in counters and *sit on high stools* to compute! While none of the technical people around here have such a setup, all agreed they'd like to. In fact, such a prospect created more excitement than any other idea.

Someone suggested a very large table be in the middle of the room (which all agree needs to be at least 10-by-14); the table would eliminate the hassle of where to put printouts and odds and ends. One programmer even wants a "whiteboard wall" in order to do flow-charting and the like on one entire wall. Everyone seemed in favor of allotting space for stereo equipment, if not cable TV as well. An easy chair and reading lamp for going over manuals met with wide agreement, but most felt one dreamer's desire for a cathedral ceiling and skylights was "pie in the sky." Still, if you are designing the ultimate computer room for your own needs, and the budget permits, why not?

If you are one of the lucky ones who do get the chance to design your very own custom computer room, I'll offer this familiar recommendation: Allocate a place for storing all the back issues of THE RAINBOW and include enough room for a lot of issues yet to come. And, since this is our "Home Help" issue, why not have a subscription "installed" for even greater convenience!

**— Jutta Kapfhammer**



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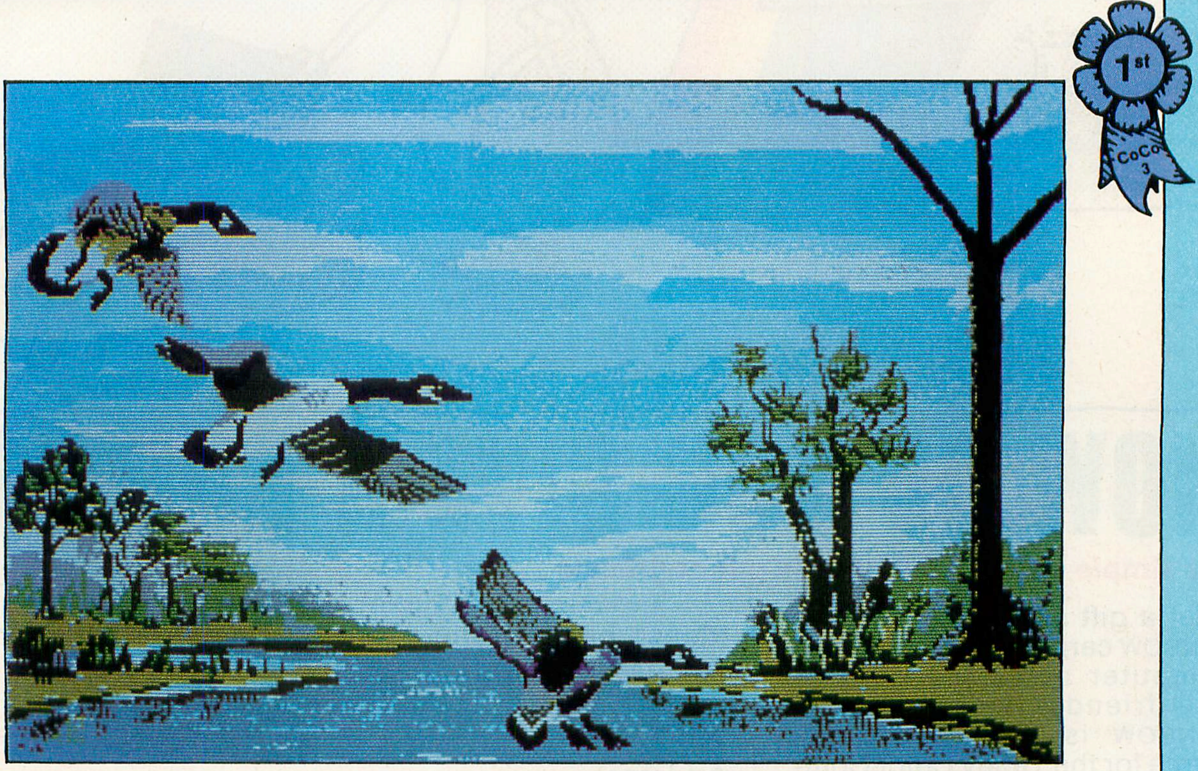
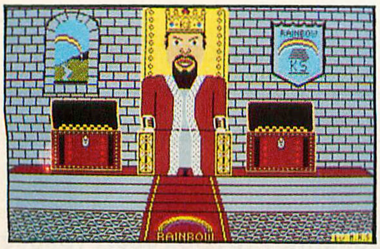
# CoCo Gallery



**Geese** **Wally Mayes**

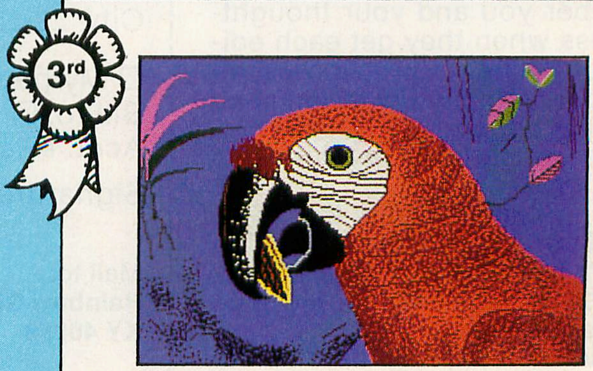
This scene expressing tranquility at its best was developed with *CoCo Max III*. Wally and his wife have four children and three grandchildren; they live in Hamilton, Ohio.

Honorable Mention



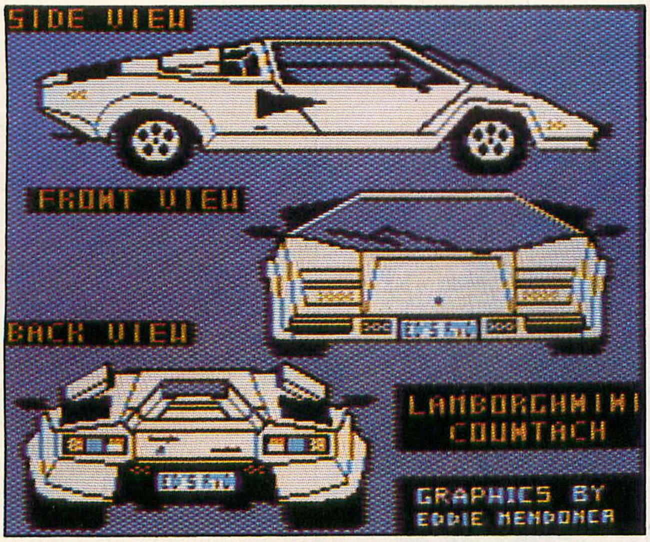
**King** **Michael Stafford**

Michael, who is 21 years old and has cerebral palsy, used BASIC and the CoCo 3 to create this graphic illustration. His main hobby is working with the CoCo; he lives in Port Orange, Florida.



**Bird** **Philip G. Scherer**

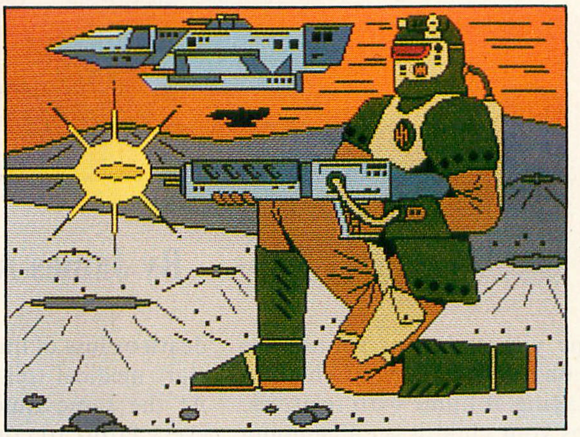
Philip, of Lauderhill, Florida, used *CoCo Max III* to show the beauty of this Scarlet Macaw. Philip is an engineering supervisor for a machinery building company in Miami and his hobbies include snorkeling, horticulture and CoCoing.



**Lambo** **Eddie Mendonca**

We are taking "CoCo Gallery" to RAINBOWfest Chicago! See Page 49 for details.

Eddie, a freshman in college, used *CoCo Max II* to create these views of a Lamborghini. He lives in Hanford, California.



**Invasion** **Francis Leduc**

*CoCo Max II* converted for the CoCo 3 through *CC-3-MAX*, from Lomiq, was used to illustrate this aggression. Francis, whose hobbies include drawing, role-playing games and computers, lives in the village of St-Honore, Quebec, Canada.

**SHOWCASE YOUR BEST!** You are invited to nominate original work for inclusion in upcoming showings of "CoCo Gallery." Share your creations with the CoCo Community! Be sure to send a cover letter with your name, address and phone number, detailing how you created your picture (what programs you used, etc.) and how to display it. Also, please include a few facts about yourself.

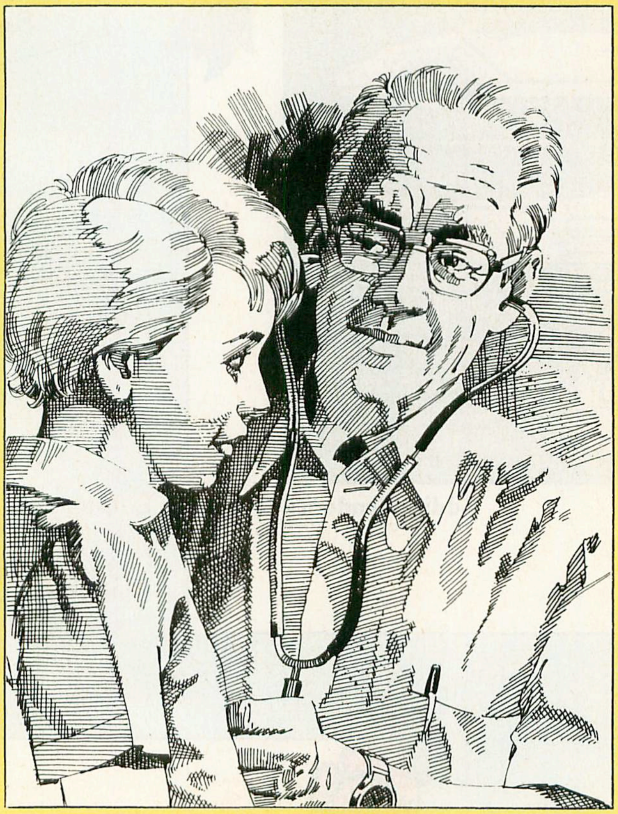
Don't send us anything owned by someone else; this means no game screens, digitized images from TV programs or material that's already been submitted elsewhere. A digitized copy of a picture that appears in a book or magazine is *not* an original work.

We will award two first prizes of $25, one for the CoCo 3 and one for the CoCo 1 and 2; one second prize of $15 and one third prize of $10. Honorable Mentions may also be given.

Please send your entry on either tape or disk to the CoCo Gallery, THE RAINBOW, P.O. Box 385, Prospect, KY 40059. Remember, this is a contest and your entry will not be returned.

**— Angela Kapfhammer, Curator**

*Generate a form to grant authorization for the medical treatment of a minor*



# Operation Child Protect

## By James A. Upperman

Imagine you and your spouse are away on a trip while your children are staying at home with relatives. Or perhaps your child is on a camping trip with a friend's family. What would happen if your child were badly injured or became seriously ill? What if your child needed immediate medical treatment?

If the illness or injury could cause death or loss of limb, the doctors would start medical treatment without delay. At the same time, they would make every effort to contact you to find out if your child has any medical conditions that might affect the treatment.

On the other hand, if the situation were not quite as serious but still definitely required medical treatment — and your child is a minor — there would be a serious complication. The doctors cannot — by law — start the necessary treatment until you are contacted and have given your consent. While the doctors try to reach you, your child must wait, without medical treatment, for hours or even days, until you are finally located. Only after you have given your consent can the doctors treat your child's injury or illness.

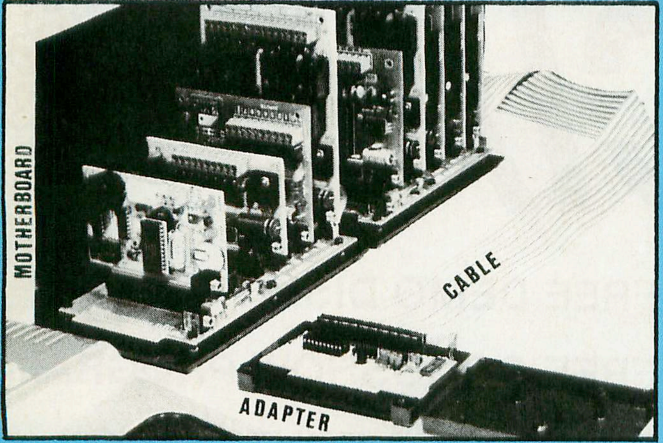
Of course, when you and your children are apart, the people caring for your children should know how to reach you at all times. However, if you think there is a chance you may be hard to contact, you can temporarily assign the authority to approve your child's unexpected medical treatment to another adult in your place. The adult can be a relative, neighbor, minister or scoutmaster — anyone over the age of 18 who will be with your child or who can be reached easily in case of an emergency.

---

*James Upperman is an architect in Columbus, Ohio, and has had his Color Computer for almost four years. He is a past president of the Central Ohio Color Computer Club.*

# The Amazing A-BUS

NEW



**An A-BUS system with two Motherboards**
**A-BUS adapter in foreground**

**The A-BUS system works with the original CoCo, the CoCo 2 and the CoCo 3.**

## Plug into the future

With the A-BUS you can plug your PC (IBM, Apple, TRS-80) into a future of exciting new applications in the fields of control, monitoring, automation, sensing, robotics, etc.

Alpha's modular A-BUS offers a proven method to build your "custom" system today. Tomorrow, when you are ready to take another step, you will be able to add more functions. This is ideal for first time experimenting and teaching.

A-BUS control can be entirely done in simple BASIC or Pascal, and no knowledge of electronics is required!

An A-BUS system consists of the A-BUS adapter plugged into your computer and a cable to connect the Adapter to 1 or 2 A-BUS cards. The same cable will also fit an A-BUS Motherboard for expansion up to 25 cards in any combination.

The A-BUS is backed by Alpha's continuing support (our 11th year, 50000 customers in over 60 countries).

The complete set of A-BUS User's Manuals is available for $10.

## About the A-BUS system:

- All the A-BUS cards are very easy to use with any language that can read or write to a Port or Memory. In BASIC, use INP and OUT (or PEEK and POKE with Apples and Tandy Color Computers)
- They are all compatible with each other. You can mix and match up to 25 cards to fit your application. Card addresses are easily set with jumpers.
- A-BUS cards are shipped with power supplies (except PD-123) and detailed manuals (including schematics and programming examples).

### Relay Card RE-140: $129

Includes eight industrial relays, (3 amp contacts, SPST) individually controlled and latched. 8 LED's show status. Easy to use (OUT or POKE in BASIC). Card address is jumper selectable.

### Reed Relay Card RE-156: $99

Same features as above, but uses 8 Reed Relays to switch low level signals (20mA max). Use as a channel selector, solid state relay driver, etc.

### Analog Input Card AD-142: $129

Eight analog inputs. 0 to +5V range can be expanded to 100V by adding a resistor. 8 bit resolution (20mV). Conversion time 120us. Perfect to measure voltage, temperature, light levels, pressure, etc. Very easy to use.

### 12 Bit A/D Converter AN-146: $139

This analog to digital converter is accurate to .025%. Input range is −4V to +4V. Resolution: 1 millivolt. The on board amplifier boosts signals up to 50 times to read microvolts. Conversion time is 130ms. Ideal for thermocouple, strain gauge, etc. 1 channel. (Expand to 8 channels using the RE-156 card).

### Digital Input Card IN-141: $59

The eight inputs are optically isolated, so it's safe and easy to connect any "on/off" devices, such as switches, thermostats, alarm loops, etc. to your computer. To read the eight inputs, simply use BASIC INP (or PEEK).

### 24 Line TTL I/O DG-148: $65

Connect 24 input or output signals (switches or any TTL device) to your computer. The card can be set for: input, latched output, strobed output, strobed input, and/or bidirectional strobed I/O. Uses the 8255A chip.

### Clock with Alarm CL-144: $89

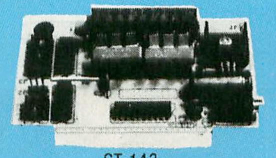
Powerful clock/calendar with: battery backup for Time, Date and Alarm setting (time and date); built in alarm relay, led and buzzer; timing to 1/100 second. Easy to use decimal format. Lithium battery included.

### Touch Tone® Decoder PH-145: $79

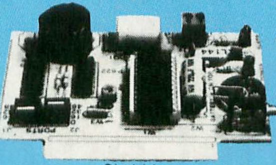
Each tone is converted into a number which is stored on the board. Simply read the number with INP or POKE. Use for remote control projects, etc.

### A-BUS Prototyping Card PR-152: $15

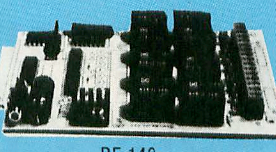
3½ by 4½ in. with power and ground bus. Fits up to 10 I.C.s



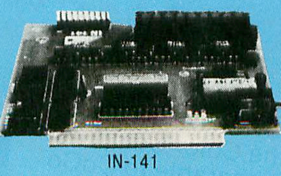
ST-143



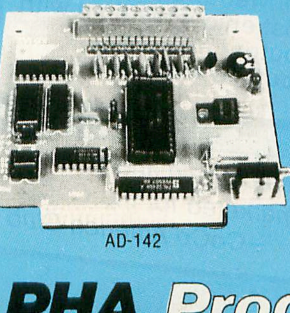
CL-144



RE-140



IN-141



AD-142

### Smart Stepper Controller SC-149: $299

World's finest stepper controller. On board microprocessor controls 4 motors simultaneously. Incredibly, it accepts plain English commands like "Move arm 10.2 inches left". Many complex sequences can be defined as "macros" and stored in the on board memory. For each axis, you can control: coordinate (relative or absolute), ramping, speed, step type (half, full, wave), scale factor, units, holding power, etc. Many inputs: 8 limit & "wait until" switches, panic button, etc. On the fly reporting of position, speed, etc. On board drivers (350mA) for small steppers (MO-103). Send for SC-149 flyer.

**Remote Control Keypad Option RC-121: $49**
To control the 4 motors directly, and "teach" sequences of motions.

**Power Driver Board Option PD-123: $89**
Boost controller drive to 5 amps per phase. For two motors (eight drivers).

**Breakout Board Option BB-122: $19**
For easy connection of 2 motors. 3 ft. cable ends with screw terminal board.

### Stepper Motor Driver ST-143: $79

Stepper motors are the ultimate in motion control. The special package (below) includes everything you need to get familiar with them. Each card drives two stepper motors (12V, bidirectional, 4 phase, 350mA per phase).
**Special Package:** 2 motors (MO-103) + ST-143: **PA-181: $99**

### Stepper Motors MO-103: $15 or 4 for $39

Pancake type, 2¼" dia, ¼" shaft, 7.5°/step, 4 phase bidirectional, 300 step/sec, 12V, 36 ohm, bipolar, 5 oz-in torque, same as Airpax K82701-P2.

### Current Developments

Intelligent Voice Synthesizer, 14 Bit Analog to Digital converter, 4 Channel Digital to Analog converter, Counter Timer, Voice Recognition.

### A-BUS Adapters for:

| | |
|---|---|
| IBM PC, XT, AT and compatibles. Uses one short slot. | AR-133...$69 |
| Tandy 1000, 1000 EX & SX, 1200, 3000. Uses one short slot. | AR-133...$69 |
| Apple II, II+, IIe. Uses any slot. | AR-134...$49 |
| TRS-80 Model 102, 200 Plugs into 40 pin "system bus". | AR-136...$69 |
| Model 100. Uses 40 pin socket. (Socket is duplicated on adapter). | AR-135...$69 |
| TRS-80 Mod 3,4,4 D. Fits 50 pin bus. (With hard disk, use Y-cable). | AR-132...$49 |
| TRS-80 Model 4P. Includes extra cable. (50 pin bus is recessed). | AR-137...$62 |
| TRS-80 Model I. Plugs into 40 pin I/O bus on KB or E/I. | AR-131...$39 |
| Color Computers (Tandy). Fits ROM slot, Multipak, or Y-cable. | AR-138...$49 |

### A-BUS Cable (3 ft, 50 cond.) CA-163: $24

Connects the A-BUS adapter to one A-BUS card or to first Motherboard.
**Special cable for two A-BUS cards: CA-162: $34**

### A-BUS Motherboard MB-120: $99

Each Motherboard holds five A-BUS cards. A sixth connector allows a second Motherboard to be added to the first (with connecting cable CA-161: $12). Up to five Motherboards can be joined this way to a single A-BUS adapter. Sturdy aluminum frame and card guides included.

- The A-BUS is not a replacement for the Multi-pak

**Add $3.00 per order for shipping.**
**Visa, MC, checks, M.O. welcome.**
**CT & NY residents add sales tax.**
**C.O.D. add $3.00 extra.**
**Canada: shipping is $5**
**Overseas add 10%**

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Orders only Except in CT **800 221-0916**
Connecticut orders: **(203) 348-9436**
All lines open weekdays 9 to 5 Eastern time

# SPECIAL

WITH YOUR
COCO MAX III ORDER:

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- FREE COCOSHOW PROGRAM
- FREE EXTRA FONTS DISK

CoCo Max™ III

**must be the most enjoyable, useful, and awesome program you've ever seen or your money back.** Instantly, no questions asked.

**CALL NOW TOLL FREE 1–800 221** Mon–Fri 9 to 5 EST **AND LET THE FUN BEGIN**

**A FEW QUOTES :**

An outstanding program that almost turns your CoCo into a replica of the Macintosh. Terrific hi-res color, very easy to learn and use.
*- Family Computing*

There is absolutely nothing else on the Color Computer that is comparable to CoCo Max's power and ease of use. The most enjoyable time with a computer I ever had.
*- Computerware Review*

I never expected to see anything like it on my CoCo screen. There isn't a single command to remember. Even a person who has no drawing ability like myself can create a presentable picture. I've spent hours just doodling enjoying all the things from silly to the serious. Fascinating experience. Buy it, you won't be sorry.
*- 6809 Express*

*In Everyone's book, CoCo Max is rated again and again as the most incredible product ever marketed for the CoCo.*
*–CoCo America Club*

Note: There is only one *CoCo Max III*. Do not confuse COLORWARE's *CoCo Max* with similar sounding imitations.

# INTRODUCING THE NEXT GENERATION: CoCo Max™ III*

More Resolution More Power More Color Built-in Animation More Speed More Type Styles More Tools Amazing Color Sequencing

## "The best program ever written for the Color Computer"

That's how thousands of enthusiastic users rated the **CoCo Max II** drawing program. With **CoCo Max III** we are ready to amaze them again. Instead of "patching" CoCo Max II, we rewrote it from scratch to take advantage of the CoCo Max III hardware. The results will knock your socks off! Below is a brief list of some of the *new* features, but some, such as **animation, color sequencing**, or the **slide show**, have to be seen. Send for the Demo Disk, and see for yourself.

**Everybody's favorite drawing package features:** - A 50% larger editing window. - Zoom area **400%** larger. - New drawing tools: **rays, 3D cubes, arcs,...** - New editing tools: shadow, text size,... - Rotate by 1.5° steps - Select any 16 of the 64 possible colors (all 64 colors displayed at once!) - Powerful **color mix**: additive, subtractive, overlay,... - Full **color editing** of patterns and color changing patterns. - Incredible **special effects** with **color cycling** up to 8 colors with variable speed. **-Animation** adds the dimension of motion to your image. (Must be seen.) - Sophisticated data compression saves up to 70% of disk space when saving pictures.

In addition, there are dozens of enhancements to the multitude of features that made CoCo Max II a best seller.

**More about CoCo Max III**

- CoCo Max III is not an upgrade of CoCo Max II. It is entirely rewritten to take advantage of the new CoCo 3 hardware (More memory, resolution, colors, speed,...)
- The new CoCo Max III **Hi-Res Interface** and the CoCo Max II **Hi-Res Pack** are *not* interchangable.
- The new interface plugs into the joystick connector.
- The CoCo Max III disk is not copy protected.
- CoCo Max III only works with the CoCo 3.
- A Y-Cable or Multi-pak is not necessary.
- Colors are printed in five shades of gray.
- CoCo Max III can read CoCo Max II pictures.

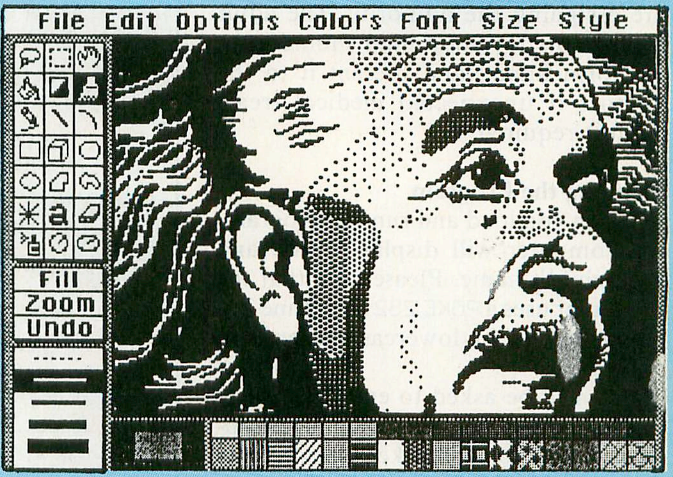
Note: CoCo Max II (for the CoCo 2) is still available on disk ($79.95). CoCo Max I is still available on tape ($69.95). For details, refer to our double page ad in any *Rainbow* from January '86 to July '87

Toll Free operators are for orders only. If you need precise answers, call the **tech line.** (Detailled CoCo Max specs are included with the Demo Disk.)

**Add $3.00 per order for shipping.**
**Visa, MC, checks, M.O. welcome.**
**CT residents add sales tax.**
**C.O.D. add $3.00 extra.**
**Canada: shipping is $5**
**Overseas add 10%**

Technical info: **(203) 656-1806**
Orders only Except in CT **800 221-0916**
Connecticut orders: **(203) 348-9436**
All lines open weekdays 9 to 5 Eastern time

* Beware of inferior imitations that *DO NOT* include a Hi-Res Interface or charge extra for each utility.



Imagine this picture in sixteen colors!

**Guaranteed Satisfaction**
**Use CoCo Max for a full month.**
**If you are not delighted with it,**
**we will refund every penny.**

**System Requirements:**
Any CoCo 3 disk system with a Joystick or a Mouse.

We apologize to tape users, CoCo Max III needs the flexibility of a disk.

The **CoCo Max III** system includes: • The special Hi-Res interface (for your mouse or joystick) • The CoCo Max III disk • Many utilities: (To convert Max II pictures, Max colors, etc.) • A detailled User's Manual. Complete system; nothing else to buy. **CoCo Max III: $79.95***

WITH COUPON ONLY

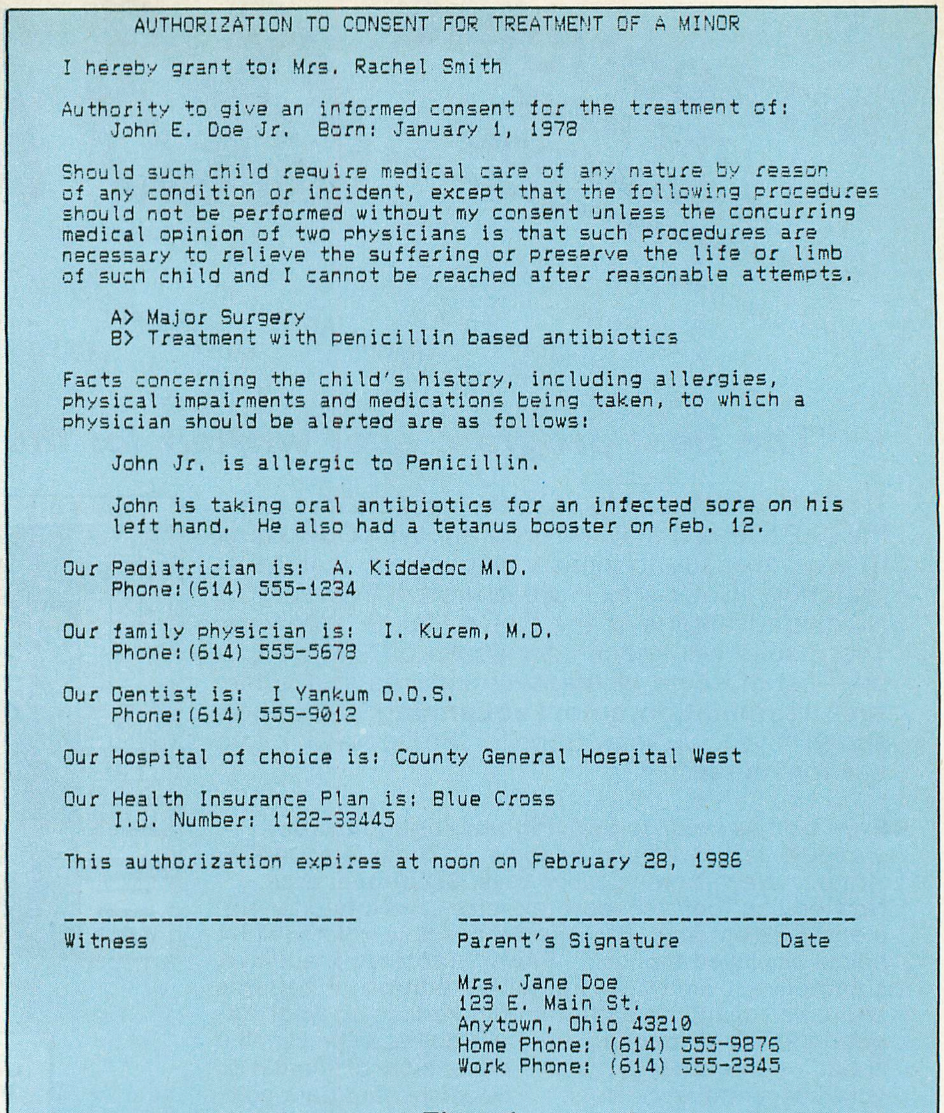
## FREE DEMO DISK

Name ____________________
Street ____________________
City ____________________
State Zip ____________________
Printer used: ____________________

Please include $2 to help defray Processing and Shipping costs. (Check, Money Order, etc. Sorry, no COD or Credit Cards). Coupon (or copy) must be mailled to:

COLORWARE
A division of Sigma Industries, Inc.

**COLORWARE**
*242-W West Avenue*
*Darien, CT 06820*



```
              AUTHORIZATION TO CONSENT FOR TREATMENT OF A MINOR

I hereby grant to: Mrs. Rachel Smith

Authority to give an informed consent for the treatment of:
    John E. Doe Jr.  Born: January 1, 1978

Should such child require medical care of any nature by reason
of any condition or incident, except that the following procedures
should not be performed without my consent unless the concurring
medical opinion of two physicians is that such procedures are
necessary to relieve the suffering or preserve the life or limb
of such child and I cannot be reached after reasonable attempts.

    A> Major Surgery
    B> Treatment with penicillin based antibiotics

Facts concerning the child's history, including allergies,
physical impairments and medications being taken, to which a
physician should be alerted are as follows:

    John Jr. is allergic to Penicillin.

    John is taking oral antibiotics for an infected sore on his
    left hand.  He also had a tetanus booster on Feb. 12.

Our Pediatrician is:  A. Kiddedoc M.D.
    Phone:(614) 555-1234

Our family physician is:  I. Kurem, M.D.
    Phone:(614) 555-5678

Our Dentist is:  I Yankum D.D.S.
    Phone:(614) 555-9012

Our Hospital of choice is: County General Hospital West

Our Health Insurance Plan is: Blue Cross
    I.D. Number: 1122-33445

This authorization expires at noon on February 28, 1986


------------------------         ---------------------------------
Witness                          Parent's Signature          Date

                                 Mrs. Jane Doe
                                 123 E. Main St.
                                 Anytown, Ohio 43210
                                 Home Phone: (614) 555-9876
                                 Work Phone: (614) 555-2345
```

**Figure 1**

*Medical Authorization* is a program that produces the document with which you temporarily assign the authority to another adult to approve unexpected medical treatment. The form also contains medical information that should be known by the doctors along with the names and phone numbers of your child's pediatrician, family doctor and dentist. You can also note any treatment that you prefer not to be performed until you are contacted (such as major surgery).

You must sign the printed form and have your signature witnessed by an adult other than the adult to whom you are assigning the authority. The adult responsible for your child should keep the form handy and present it to the doctors if unexpected medical treatment is required.

**Running the Program**

When you load and run the program, the computer will display a title and your child's name. Please note that the computer uses a `POKE 282,0` in Line 210 to place you in lowercase when you type.

You will be asked to enter the name of the person you are making responsible. Then you are asked to enter the date on which the authorization expires.

Next, the medical history permanently contained in the program is displayed. You are asked whether you want to add to the information. If you press Y (Yes), you will be prompted to type in up to 250 characters. Do not worry about the printout format — lines 620 to 670 contain a short wordwrap routine that ends each printed line at a space rather than in the middle of a word.

Finally, the program displays the parents' names and asks which parent is signing the form. You will then be prompted to set up the printer and press ENTER when ready.

**Typing in the Program**

If you have two or more children, you are required to have a separate form for each child. All information that relates directly to one child can easily be edited to create a version for another child. The `MED` in the sample program name should be changed to the child's initials or some other means of identification. The programs for my two children are `AUTH CJU` and `AUTH EMU`.

When you type in the program, insert the permanent information concerning your child into the strings in lines 1000 to 1200. Note that the information shown in the listing is only a sample to show the format of the entries. Do not use these entries; rather, substitute the information concerning your child in their places. Your permanent information will include your child's name; date of birth; any treatment you want restricted; permanent medical history; the names and phone numbers of your pediatrician, family doctor and dentist; hospital of choice; hospitalization; and the parents' names along with home and work phone numbers.

Again, please note that the program uses `POKE 282,0`, so you should input all information in lower- and uppercase letters. You should use the SHIFT-0 combination before and after typing in the information that is printed in lowercase in the listing. This gives a uniform printout that looks quite distinguished. (See Figure 1.)

When you are typing in your child's medical history (`HI$` in Line 1030), you do not have to worry about how the information will print out. I have included another simple wordwrap routine in lines 550 to 600.

You may not have anything to include for a particular entry. Perhaps your family physician is caring for your child and you do not have a specific pediatrician. In this case, you may omit that particular line at the end of the program. Preferably, though, you should place an apostrophe (') or the command `REM` after the line number to make that line into a remarked statement. This would allow you to use that entry in the future if the occasion arises.

The computer will usually skip all lines referring to the omitted entry on the form. If the medical history section or the hospital of choice entry is omitted, the form will contain a note stating that there are no specific instructions at this time. This is to prevent confusion by emergency personnel who may think the information was accidentally omitted rather than deliberately deleted.

Also, you can change or add to the

doctors listed in the sample program. For example, you may want to list a specific allergist. You should change or add to the doctors' identification strings at the end of the program, along with the printing instructions located in lines 690 to 710. The format used should be the same as for the other doctors.

Special printer control codes are not required for the printing of the document, which makes the program easy to use by owners of all types of printers. A form feed, `CHR$(12)`, is used in Line 830 to advance the paper when printing is done; this can be deleted if your printer does not accept it. You can add special codes, as you wish, to dress up the document. Be careful, though, in adding too many features to the form: When the permanent medical history string and the additional information entry are both near maximum length, the form uses almost the entire length of an 11-inch sheet of paper.

The document generated by this program is based on a form distributed as a public service by Riverside Methodist Hospital in Columbus, Ohio. It is the kind of form that every family should keep on hand and fill out whenever parents or children will be away from home. Unfortunately in my case, when I need a form such as this one, I usually have no idea where I've put my copy for "safekeeping," or I've already used my last copy without making a duplicate blank. By using this program, you can make a ready copy quickly, without having to look up names and phone numbers and without accidentally omitting important information.

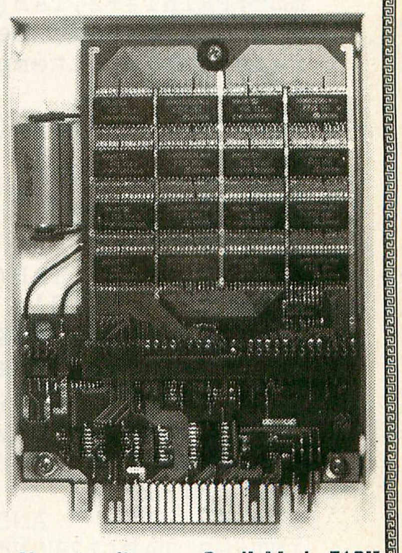
---

*(Questions or comments regarding this program may be directed to the author at 5201 Wilcox Road, Amlin, OH 43002. Please enclose an SASE when writing for a response.)* □

| | |
|---|---|
| 260 | ......131 |
| 410 | ......193 |
| 500 | ......122 |
| 660 | ......214 |
| 760 | ......109 |
| 920 | .......29 |
| END | .....157 |

**The listing:** `MED FORM`

```
10 '******************************
20 'AUTHORIZATION TO CONSENT
30 'FOR THE TREATMENT OF A MINOR
40 '******************************
50 'PROGRAM BY J. A. UPPERMAN
60 'BASED ON AN AUTHORIZATION
70 'FORM BY RIVERSIDE METHODIST
80 'HOSPITAL, COLUMBUS, OHIO
90 '******************************
150 'ENTER THE INFORMATION THAT
160 'APPLIES TO YOU AND YOUR
170 'CHILD STARTING AT LINE 1000
180 '*****************************
200 CLEAR 1500:GOSUB 1000
210 POKE 282,0
220 CLS:PRINT"AUTHORIZATION TO C
ONSENT FOR":PRINT"TREATMENT OF:"
:PRINT CH$:GOSUB 880
230 PRINT"NAME OF PERSON BEING A
PPOINTED  GUARDIAN?"
240 LINE INPUT GA$:IF GA$="" THE
N SOUND 100,1:SOUND 50,2:GOTO 23
0 ELSE GOSUB 880
250 PRINT"AUTHORIZATION EXPIRES
ON NOON":PRINT"OF WHAT DATE?"
260 LINE INPUT EX$:IF EX$="" THE
N SOUND 150,1:SOUND 100,2:GOTO 2
50 ELSE GOSUB 880
270 PRINT"MEDICAL HISTORY ON FIL
E:": IF HI$="" THEN PRINT:PRINT"
<<NOTHING ON FILE AT THIS TIME>>
":PRINT:GOTO 290
280 PRINT HI$
290 PRINT"DO YOU WISH TO ADD TO
THIS      INFORMATION <y/n>";
300 INPUT YN$:IF YN$="n" OR YN$=
"N" THEN 330 ELSE IF YN$<>"y" AN
D YN$<>"Y" THEN 290
310 CLS:PRINT"TYPE IN ADDITIONAL
 INFORMATION":PRINT"(250 CHARACT
ERS MAXIMUM)":PRINT
320 LINE INPUT MH$
330 GOSUB 880:PRINT"PARENT SIGNI
NG FORM:"
340 PRINT"1> ";PA$(1):PRINT"2> "
;PA$(2):INPUT"ENTER 1 OR 2";PN
350 IF PN<>1 AND PN<>2 THEN 330
```



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```
360 GOSUB 880
370 PRINT"SET THE PRINTER TO THE
 TOP OF  THE PAPER"
380 PRINT:INPUT"PRESS <ENTER> WH
EN READY.";YN$
390 '***************************
400 'PRINTING FORM
410 CLS:PRINT"PLEASE WAIT - PRIN
TING FORM":GOSUB 880
420 FOR CT=1 TO 2:PRINT#-2:NEXT
430 PRINT#-2,TAB(14)"AUTHORIZATI
ON TO CONSENT FOR TREATMENT OF A
 MINOR"
440 PRINT#-2:PRINT#-2,TAB(8)"I h
ereby grant to: ";GA$
450 PRINT#-2:PRINT#-2,TAB(8)"Aut
hority to give an informed conse
nt for the treatment of:":PRINT#
-2,TAB(12)CH$;"  Born: ";DA$:PRI
NT#-2
460 PRINT#-2,TAB(8)"Should such
child require medical care of an
y nature by reason":PRINT#-2,TAB
(8)"of any condition or incident
, except that the following proc
edures":PRINT#-2,TAB(8)"should n
ot be performed without my conse
nt unless the concurring"
470 PRINT#-2,TAB(8)"medical opin
ion of two physicians is that su
ch procedures are":PRINT#-2,TAB(
8)"necessary to relieve the suff
ering or preserve the life or li
mb":PRINT#-2,TAB(8)"of such chil
d and I cannot be reached after
reasonable attempts."
480 PRINT#-2
490 PRINT#-2,TAB(12)"A> Major Su
rgery"
500 IF OT$<>"" THEN PRINT#-2,TAB
(12)"B> ";OT$
510 PRINT#-2
520 PRINT#-2,TAB(8)"Facts concer
ning the child's history, includ
ing allergies,":PRINT#-2,TAB(8)"
physical impairments and medicat
ions being taken, to which a":PR
INT#-2,TAB(8)"physician should b
e alerted are as follows:"
530 PRINT#-2
540 IF HI$="" AND MH$="" THEN PR
INT#-2,TAB(12)"No special instru
ctions at this time.":GOTO 680
550 A$=HI$+" "
560 IF A$="" OR A$=" " THEN 610
570 FOR CT=60 TO 1 STEP-1
580 IF MID$(A$,CT,1)<>" "THEN NE
XT
590 B$=LEFT$(A$,CT):PRINT#-2,TAB
(12);B$
600 A=LEN(A$):A$=RIGHT$(A$,(A-CT
)):GOTO 560
610 PRINT#-2
620 C$=MH$+" "
630 IF C$="" OR C$=" " THEN 680
640 FOR CT=60 TO 1 STEP-1
650 IF MID$(C$,CT,1)<>" "THEN NE
XT
660 D$=LEFT$(C$,CT):PRINT#-2,TAB
(12);D$
670 C=LEN(C$):C$=RIGHT$(C$,(C-CT
)):GOTO 630
680 PRINT#-2
690 IF PE$<>"" THEN PRINT#-2,TAB
(8)"Our Pediatrician is:  ";PE$:
PRINT#-2,TAB(12)"Phone:";PP$:PRI
NT#-2
700 IF FA$<>"" THEN PRINT#-2,TAB
(8)"Our family physician is:  ";
FA$:PRINT#-2,TAB(12)"Phone:";FP$
:PRINT#-2
710 IF DE$<>"" THEN PRINT#-2,TAB
(8)"Our Dentist is:  ";DE$:PRINT
#-2,TAB(12)"Phone:";DP$:PRINT#-2
720 PRINT#-2,TAB(8)"Our Hospital
 of choice is: ";
730 IF HO$="" THEN PRINT#-2,"No
specific Hospital":PRINT#-2 ELSE
 PRINT#-2,HO$:PRINT#-2
740 IF HE$<>"" THEN PRINT#-2,TAB
(8)"Our Health Insurance Plan is
: ";HE$:PRINT#-2,TAB(12)"I.D. Nu
mber: ";ID$:PRINT#-2
750 PRINT#-2,TAB(8)"This authori
zation expires at noon on ";EX$
760 PRINT#-2:PRINT#-2:PRINT#-2:P
RINT#-2,TAB(8)STRING$(24,"-");TA
B(40);STRING$(32,"-")
770 PRINT#-2,TAB(8)"Witness";TAB
(40);"Parent's Signature
Date"
780 PRINT#-2:PRINT#-2,TAB(40);PA
$(PN)
790 PRINT#-2,TAB(40);ST$
800 PRINT#-2,TAB(40);CI$
810 PRINT#-2,TAB(40);"Home Phone
: ";HP$
820 IF WP$(PN)<>"" THEN PRINT#-2
,TAB(40)"Work Phone: ";WP$(PN)
830 PRINT#-2,CHR$(12); 'FORM FEE
D -OMIT IF YOUR PRINTER DOES NOT
  ACCEPT IT.
840 CLS:PRINT"THE FORM FOR ":PRI
NTCH$:PRINT"IS FINISHED PRINTING
."
850 POKE 282,255
860 END
870 '***************************
880 PRINT STRING$(32,"*"):RETURN
900 '***************************
910 'SUBSTITUTE THE INFORMATION
THAT APPLIES TO YOU AND YOUR
```

```
CHILD ON THE FOLLOWING LINES.
920 'note!  ANY LINE THAT DOES
NOT APPLY TO YOU OR YOUR CHILD,
SUCH AS A SPECIFIC TYPE OF DOC-
TOR OR PARENT'S WORK PHONE NUM-
BER MAY BE OMITTED OR PRECEDED
WITH AN APOSTROPHE <'>.  THE
COMPUTER WILL SKIP THAT ENTRY ON
THE FORM.
990 '****************************
1000 CH$="John E. Doe Jr."  'CHI
LD'S NAME
1010 DA$="January 1, 1978" 'CHIL
D'S DATE OF BIRTH
1020 OT$="Treatment with penicil
lin based antibiotics"'OTHER TRE
ATMENT RESTRICTED. 50 CHARACTERS
 MAXIMUM.
1030 HI$="John Jr. is allergic t
o Penicillin."
1040 'HI$ IS THE CHILD'S MEDICAL
 HISTORY.  240 CHARACTER MAXIMUM
 LENGTH.
1050 PE$="A. Kiddedoc M.D." 'PED
IATRICIAN
1060 PP$="(614) 555-1234" 'PEDIA
TRICIAN'S PHONE
1070 FA$="I. Kurem, M.D. "  'FAM
ILY DOCTOR
1080 FP$="(614) 555-5678" 'FAMIL
Y DOCTOR'S PHONE
1090 DE$="I Yankum D.D.S." 'FAMI
LY DENTIST
1100 DP$="(614) 555-9012" 'DENTI
ST'S PHONE
1110 HO$="County General Hospita
l West" 'HOSPITAL OF CHOICE
1120 HE$="Blue Cross" 'HEALTH IN
SURANCE
1130 ID$="1122-33445" 'I.D. NUMB
ER
1140 PA$(1)="Mr. John E. Doe, Sr
." 'FATHER'S NAME
1150 PA$(2)="Mrs. Jane Doe" 'MOT
HER'S NAME
1160 ST$="123 E. Main St." 'STRE
ET ADDRESS
1170 CI$="Anytown, Ohio 43210" '
CITY AND STATE
1180 HP$="(614) 555-9876" 'HOME
PHONE
1190 WP$(1)="(614) 555-5432" ' F
ATHER'S WORK PHONE
1200 WP$(2)="(614) 555-2345" ' M
OTHER'S WORK PHONE
1210 RETURN
```

# Run VIP on your Color Computer 1, 2 or 3!

## VIP Calc

**"MORE USEABLE FEATURES"-Feb 1985 "Rainbow"**

Now every CoCo owner has access to a calculating and planning tool better than VisiCalc, *containing all* its features and commands and then some. VIP Calc displays 32, 51, 64 or 85 characters by 21 or 24 lines right on the screen. VIP Calc allows up to a 33K worksheet with up to 512 columns by 1024 rows! In addition, VIP calc has multiple windows which allow you to compare and contrast results of changes. Other features include 16 DIGIT PRECISION • trig. functions • averaging • algebraic functions • column and row ascending or descending SORTS • locate formulas or titles in cells • block move and replicate • global or local column width • limitless programmable functions • works with any printer, Embed printer control codes for customized printing. Combine spreadsheet tables with VIP Writer documents to create ledgers, projections, statistical and financial budgets and reports. Requires 64K. **TAPE $49.95 DISK $59.95**

## VIP Database

**"ONE OF THE BEST" JULY 1984 "RAINBOW"**

The VIP Database features selectable screen displays of 51, 64 or 85 characters by 24 lines for maximum utility. It will handle as many records as will fit on your disks and is structured in a simple and easy to understand menu system with full prompting for easy operation. Your data is stored in records of your own design. All files are fully indexed for speed and efficiency. Full sort of records is provided for easy listing of names, figures, addresses etc., in ascending or descending alphabetic or numerical order. Records can be searched for specific entries, using multiple search criteria. With Database mail-merge you may also combine files, sort and print mailing lists, print form letters, address envelopes - the list is endless. The built-in MATH package even performs arithmetic operations and updates other fields. VIP Database also has unlimited print format and report generation with embedable control codes for use with all printers. **DISK $49.95**

## Coming Soon: VIP Database III

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For your important communications needs you've got to go beyond software that only lets you chat. You need a smart terminal so that you can send and receive programs and messages and print them! The VIP Terminal features 32, 51, 64 or 85 characters by 21 or 24 lines on the screen and has a 43,000 byte buffer in a 64K computer to store information. Requires 32K **TAPE $29.95 DISK $39.95**

**CoCo 3 owners upgrade your VIP Calc, Database or Terminal to run on the CoCo 3 for $30 +$3 S/H. Send original product.**

## VIP Disk-Zap

**RAVED ABOUT IN THE APRIL 1983 "RAINBOW"**

VIP Disk-Zap is the ultimate repair utility for simple and quick repair of most disk errors. Designed with the non-programmer in mind, the VIP Disk-Zap will let you retrieve all types of bashed files, BASIC and Machine Code programs. The 50 page tutorial makes the novice an expert. **DISK $24.95**

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*A database for all your old family recipes*

# Good Things Are Cookin' on CoCo

## By Brad Spencer

Are you tired of the same sloppy, disorganized recipe box? With *Recipe Filer* you can say goodbye to all those greasy old cards and store your family secrets on your CoCo.

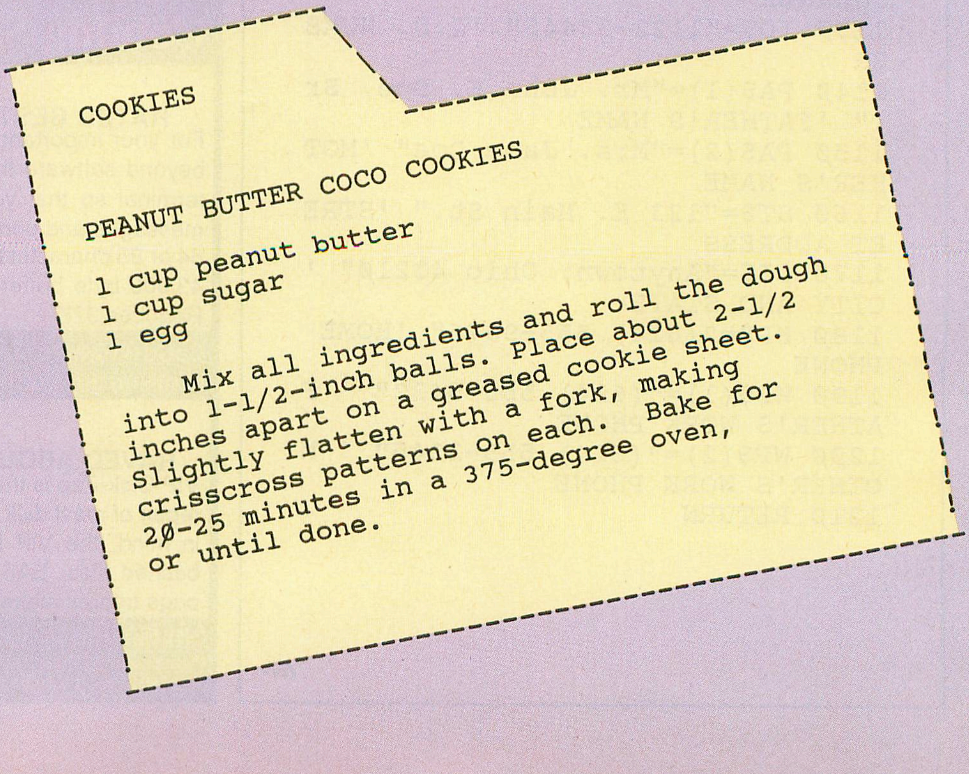
*Recipe Filer* allows you to save, load, edit and print out your recipes in a 3-by-5 card format. You can even categorize your concoctions so that finding them will be fast.

The program is user-prompting, menu-driven and very easy to use. On running the program, you are presented with the main menu and its six numbered options: Enter Recipe, List Recipe, Print Recipe, Save Recipe, Load Recipe and Edit Recipe. Just press a number — you won't need to press `ENTER`, as I used `INKEY$` instead of an `INPUT` command.

**Filing It Away**

Before you can do anything else with this program, you must enter a recipe. At the main menu, press 1 (Enter Recipe). You are dropped into the Categories submenu, where you must choose the category under which you will file your recipe — main dishes, cakes, salads, pastry, soups, meats, etc.

There are 10 categories, including "Other" for dishes that don't fit into the categories I have provided. For the submenu prompts, I used `INPUT` com-



```
COOKIES

PEANUT BUTTER COCO COOKIES

1 cup peanut butter
1 cup sugar
1 egg

     Mix all ingredients and roll the dough
into 1-1/2-inch balls. Place about 2-1/2
inches apart on a greased cookie sheet.
Slightly flatten with a fork, making
crisscross patterns on each.  Bake for
20-25 minutes in a 375-degree oven,
or until done.
```

---

*Brad Spencer is a student in Crawfordsville, Indiana, and has been programming for the CoCo for four years. He enjoys making programs for the special education classes at his school.*

# Telewriter-128™

## the Color Computer 3 Word Processor

For over 5 years now, Telewriter has been the #1 Color Computer word processor, both in popularity and in performance. Telewriter's near perfect mix of sophisticated professional features and a very natural user interface, has earned it the highest praise in numerous magazines, and an intensely loyal following among tens of thousands of Color Computer users all over the world.

### HISTORY

Throughout the history of the Color Computer, Telewriter has pioneered software breakthroughs that set the standards.

In 1981, it was Telewriter 1.0 that first took the Color Computer's inadequate 32X16 all-uppercase display, and replaced it with a graphics-based 51X24 upper and lowercase display.

A few years later, Telewriter-64 added high density 64X24 and 85X24 displays and access to the full 64K of the newer Color Computers.

### THE NEW AGE

Today, Telewriter-64 is recognized as the standard Color Computer word processor. It runs on all Tandy Color Computers — from the original Color Computer 1, to the Color Computer 2, and 3.

But the Color Computer 3 brings a whole new level of power to low cost computing and, so, a new Telewriter is here to put that power to work for you. We call it Telewriter-128.

### TELEWRITER-128

You don't mess with a good thing, so Telewriter-128 is still Telewriter-64 at heart. The commands, and the user interface are essentially the same. If you know Telewriter-64, then you already know Telewriter-128. And, if you don't know Telewriter-64, you'll still have an easy time learning and using Telewriter-128.

### 80 COLUMNS

But there are major differences as well. First, Telewriter-128 uses the Color Computer 3's new 80 column screen display.

This means, simply, that using Telewriter-128 on a low cost Color Computer 3 will look a lot like using a more expensive word processor on a much more expensive IBM PC, PS/2, or clone.

### SPEED

Second, Telewriter-128 is lightning fast. Telewriter-64 was fast in its own right, but, by accessing the Color Computer 3's video hardware directly, and by running the machine in double speed mode, Telewriter-128 is able to provide extremely fast scrolling and instant paging — functions whose speed is crucial to serious word processing.

In this department, Telewriter-128 doesn't simply keep up with IBM-based word processors — it generally surpasses them!

### EASE

Third, Telewriter-128 adds a host of new features big and small, that make it even easier to use.

Features like: Quick function key access to the editor or the menus — an instant on-line help screen summarizing all Telewriter commands and special characters — an option file where you store your personal set of format and screen settings so you only have to set them once!

Then, there's a quick save feature which allows you to save all your current work without leaving the editor. There's a simple way to cursor through the disk directory and read in a file by just hitting ENTER. And there's more.

### NEW POWER

Telewriter-64 always had the power to handle any kind of serious writing, from letters to textbooks. But, here too, Telewriter-128 adds major features.

Like Macros — which let you insert whole words or phrases (even sets of control codes or format commands) into your text, with a single keypress. And every time you power up Telewriter-128, the macro definitions are automatically loaded*, so they're always there.

Then there's a Print Preview feature that shows you, on-screen, the way your printed text will look — with margins, headers, centering, justification, page numbering, and page breaks. This guarantees letter perfect documents every time, and makes tasks like widow/orphan line elimination, a breeze.

### TELEWRITER-64 OR TELEWRITER-128

We could go on listing features, but the point is this: If you own a Color Computer, you already have the hardware for the most powerful, low cost word processor in town. All you need now is to add the heart and soul:

**Telewriter-64,** for the Color Computer 1 and 2, costs $59.95 on disk, $49.95 on cassette.

**Telewriter-128** for the Color Computer 3 costs $79.95 on disk, $69.95 on cassette.

To order by Mastercard or Visa call (619) 755-1258 anytime, or send check or money order plus $2 shipping (Californians add 6% sales tax) to:

**COGNITEC**
704 Nob Ave.
Del Mar, CA 92014

To upgrade from Telewriter-64 to Telewriter-128, return your original disk or cassette with $39.95. (Add $10 if you're also upgrading from cassette to disk. Deduct $10 with proof of Oct '87 - Feb '88, purchase of Telewriter-64.)

> *When I first got Telewriter-64 last year, I was in heaven. I couldn't believe the program's versatility and ease of use.*
> -The RAINBOW, Oct. 1985

**TELEWRITER-64 FEATURES**: Compatibility with any printer that works with the Color Computer; embedded control codes for underlining, boldface, sub/superscript, variable fonts; format commands for headers, centering, margin and spacing changes anywhere in the document; Format menu to set margins, spacing, page numbering, BAUD rate, lines per page, justification; Chain printing for one shot printing of multi-file documents. Fast, full-screen editor with wordwrap, block copy/move/delete, global search and replace, wild card search, fast 4-way auto-repeat cursor, fast scrolling, forward and backward paging, text alignment, tabs, error protection, word and line counter. Insert or delete text anywhere on the screen. Simple, easy to remember commands. Optional ASCII files for compatibility with spell checkers, terminal programs, and BASIC. Load, save, append, partial save files to disk or cassette. Kill, rename and list disk files. Cassette verify and auto-retry on error.

**TELEWRITER-128 - ADDITIONAL FEATURES**: Print preview from editor; multiple copy print; footers; hanging indents; cursor thru disk directory to load, append, rename and kill files; quick file save from editor; keyclick; key repeat; true block move; 24, 25, or 28 line screen; 40 or 80 column screen; dual speed cursor; on-line help; overstrike mode; word delete; wordwrap at margin; user definable macros; nested macros; instant status window for information on cursor position, word count, etc.; instant function key access to menus or editor; options menu for setting character and screen colors, key repeat and delay rates, definable foreign symbols.

IBM and PS/2 are trademarks of International Business Machines Inc. *disk version only mands, so press ENTER after pressing the category number of your choice. (As you may notice, I have reserved four categories for sweets. If you are not as sweetly inclined, feel free to edit lines 80 and 140, substituting categories of your choice.)

After you choose the category, you are dropped into the "Enter Recipe" screen. As you are reminded onscreen, you have 30 lines in which to write your recipe, and are limited to a maximum of 40 characters per line. You'll notice the cursor blinking at the beginning of the first line — that means start typing! If you want upper- and lowercase capability, press the SHIFT-0 combination before you begin, but make sure you "turn it off" by pressing the combination again when you're finished.

When you have reached the end of your first line (which you will probably want to reserve for the title), press ENTER. If you entered too many characters, the program will tell you so and have you enter the line again. Just keep entering lines and pressing ENTER for each until you reach the 30th line. (Even if your recipe takes up only 10 lines, you must "use up" 30 lines — just keep pressing ENTER.) When you have entered the 30th line, you are told you have no lines left and are booted back to the main menu. You've done it! The hard part is over!

### Your Options

Now that you've entered a recipe, you'll probably want to look at it. Press 2 (List Recipe) at the main menu to list your creation. Your recipe slowly scrolls up the screen. Press any key to return to the main menu. If you noticed any mistakes in the recipe, you can correct them by pressing main menu's Option 6 (Edit Recipe).

From the Edit screen, you must choose to edit either the category name or a line. If you choose to edit a line, you will again see the recipe scroll by. Find the line that needs fixing and type in its number. If, for example, Line 5 needs editing, press 5 and then ENTER. A new, blank Line 5 appears; re-enter it. You are then booted back to the main menu. If there are more mistakes to correct, repeat the process.

When you have the recipe corrected, you will want to save it. Just press 4 (Save Recipe) at the main menu and follow the prompts. *Recipe Filer* was designed for a disk system, but if you have a cassette, you can modify the program for your use: Change all occurrences of `WRITE #1` to `PRINT #1`; `INPUT #1` to `INPUT#-1`; `OPEN #1` to `OPEN#-1`; and `CLOSE #1` to `CLOSE #-1`.

Now that your recipe is saved, you can call it back into memory whenever you want by pressing 5 (Load Recipe) at the main menu and answering the prompts.

Trying to follow your recipe from a monitor in the kitchen would not be very practical, so I have included an option that prints out your recipe in a 3-by-5 inch format (in case you're missing those greasy cards). Just press 3 (Print Recipe) at the main menu and follow the prompts. Most printers should work fine.

You can cut out your new "cards" and store them in the old recipe box. But you won't have to worry about losing them or cramping your hand copying cooking instructions for dinner guests who *must* have your recipe!

*(Questions or comments about this program may be directed to the author at #2 McCormick Drive, Crawfordsville, IN 47933. Please enclose an SASE when writing for a reply.)* ☐

---

## Corrections (See Page 14 for additional corrections.)

**"The Post Office" (March 1988, Page 104):** Due to a production error, a portion of the *Post Office* program was inadvertently omitted from the magazine. The following lines should be added to the program. RAINBOW ON TAPE and RAINBOW ON DISK were not affected and include the complete program.

```
6485 IF A=0 AND INSTR(DF$,SD$)>0
 THEN FL(2)=1:RETURN
6490 IF A=0 AND INSTR(DO$,SD$)>0
 THEN FL(2)=1:RETURN
6495 RETURN
6500 '-- PRINT AND INPUT SUBROUT
INE --
6505 PRINTTAB(TB)"         CODE:"
;:ATTR 1,0:PRINTV$(1)
6510 PRINTTAB(TB)"         NAME:"
;:ATTR 1,0:PRINTV$(2)
6515 PRINTTAB(TB)"      ADDRESS:"
;:ATTR 1,0:PRINT V$(3)
6520 PRINTTAB(TB)"         CITY:"
;:ATTR 1,0:PRINT V$(4)
6525 PRINTTAB(TB)"        STATE:"
;:ATTR 1,0:PRINTV$(5)
6530 PRINTTAB(TB)"          ZIP:"
;:ATTR 1,0:PRINTV$(6)
6535 PRINTTAB(TB)" TELEPHONE #:"
;:ATTR 1,0:PRINTV$(7)
6540 PRINTTAB(TB)"    F,L NAME:"
;:ATTR 1,0:PRINTV$(8)
6545 PRINTTAB(TB)"      COUNTRY:"
;:ATTR 1,0:PRINTV$(9)
6550 LOCATE 0,9
6555 GU=0:R=9:C=DC:L=10:VN=1:GOS
UB 7000:IF GU=1 THEN 6555
6560 GU=0:R=10:C=DC:L=25:VN=2:GO
SUB 7000:IF GU=1 THEN 6555
6565 R=11:C=DC:L=25:VN=3:GOSUB 7
000:IF GU=1 THEN 6560
6570 GU=0:R=12:C=DC:L=25:VN=4:GO
SUB 7000:IF GU=1 THEN 6565
6575 GU=0:R=13:C=DC:L=10:VN=5:GO
SUB 7000:IF GU=1 THEN 6570
6580 GU=0:FL(3)=1:GOSUB 7150:GOS
UB 7040:R=14:C=DC:L=7:VNN=6:GOSU
B 7000:IF GU=1 THEN 6575
6585 GU=0:R=15:C=DC:L=14:VN=7:GO
SUB 7000:IF GU=1 THEN 6580
6590 GU=0:R=16:C=DC:L=25:VN=8:GO
SUB 7000:IF GU=1 THEN 6585
6595 GU=0:R=17:C=DC:L=25:VN=9:GO
SUB 7000:IF GU=1 THEN 6590
6600 RETURN
6605 '-- INPUT LIMIT SUB-ROUTINE
 --
6610 S$=""
6615 M=L+C
6620 LOCATE C,R
6625 P=C-1
6630 LOCATE P+1,R:GOSUB 7190
6635 IF IK$=CHR$(9) THEN 6630
6640 IF IK$="^" THEN UA=1:RETURN
6645 IF IK$=CHR$(8) AND  P=(C-1)
 THEN S$="":GOTO 6630 ELSE IF IK
$=CHR$(8) THEN LOCATE P,R:ATTR 3
,0:PRINT" ";:LOCATE P-1,R:P=P-1:
S$=MID$(S$,1,LEN(S$)-1):GOTO 663
0
```

**For quicker reference, Corrections will be posted on Delphi as soon as they are available in the Info on Rainbow topic area of the database. Just type `DATA` at the CoCo SIG> prompt and `INFO` at the TOPIC> prompt.**

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|  |  |
|---|---|
| 100 | 249 |
| 150 | 103 |
| 260 | 147 |
| 320 | 55 |
| 430 | 97 |
| 540 | 47 |
| END | 101 |

**The listing:** RECIPES

```
10 ' RECIPE FILER
20 ' BY BRAD SPENCER
30 CLEAR 2000:DIM W$(30)
40 CLS:PRINT@41,"RECIPE FILER":P
RINT@96,"1> ENTER RECIPE":PRINT
"2> LIST RECIPE":PRINT "3> PRINT
 RECIPE":PRINT "4> SAVE RECIPE":
PRINT "5> LOAD RECIPE":PRINT "6>
 EDIT RECIPE":PRINT@352,"SELECT
(1-6):";
50 A$=INKEY$:IF A$="" THEN 50
60 IF A$<>"1" AND A$<>"2" AND A$
<>"3" AND A$<>"4" AND A$<>"5" AN
D A$<>"6" THEN 50 ELSE ON VAL(A$
) GOTO 80,180,230,370,440,520
70 ' ENTER RECIPE
80 CLS:PRINT@9,"ENTER RECIPE":PR
INT@64,"CATEGORIES:":PRINT "1> B
ROWNIES":PRINT "2> CAKES":PRINT
"3> COOKIES":PRINT "4> DESSERTS"
:PRINT "5> MAIN DISHES":PRINT "6
> MEATS":PRINT "7> PASTRY":PRINT
 "8> SALADS":PRINT "9> SOUPS":PR
INT "10> OTHER"
90 INPUT "CHOOSE (1-10):";CA$:IF
 VAL(CA$)>10 THEN 90 ELSE IF VAL
(CA$)=10 THEN 130 ELSE CLS:PRINT
@9,"ENTER RECIPE":PRINT@64,"LIMI
T OF 30 LINES.":PRINT "(44 CHARA
CTERS OR LESS)":PRINT:LI=1:X=1:G
OTO 140
100 PRINT LI;"> ";:LINE INPUT ""
;W$(X):IF LEN(W$(X))>44 THEN PRI
NT "TOO MANY CHARACTERS!":GOTO 1
00 ELSE 110
110 IF W$(X)="END" THEN 40 ELSE
IF LI>29 THEN 120 ELSE LI=LI+1:X
=X+1:GOTO 100
120 LI=LI+1:PRINT "NO MORE LINES
 LEFT.":FOR D=1 TO 1000:NEXT D:G
OTO 40
130 INPUT "NAME OF CATEGORY";CB$
:IF LEN(CB$)>13 THEN PRINT "13 C
HARACTERS OR LESS!":GOTO 130 ELS
E CLS:PRINT@9,"ENTER RECIPE":PRI
NT@64,"LIMIT OF 30 LINES.":PRINT
 "(44 CHARACTERS OR LESS)":PRINT
:LI=1:X=1:GOTO 100
140 IF CA$="1" THEN CB$="BROWNIE
S" ELSE IF CA$="2" THEN CB$="CAK
ES" ELSE IF CA$="3" THEN CB$="CO
OKIES" ELSE IF CA$="4" THEN CB$=
"DESSERTS" ELSE IF CA$="5" THEN
CB$="MAIN DISHES" ELSE IF CA$="6
" THEN CB$="MEATS" ELSE 150
150 IF CA$="7" THEN CB$="PASTRY"
 ELSE IF CA$="8" THEN CB$="SALAD
S" ELSE IF CA$="9" THEN CB$="SOU
PS" ELSE IF CA$<>"1" AND CA$<>"2
" AND CA$<>"3" AND CA$<>"4" AND
CA$<>"5" AND CA$<>"6" AND CA$<>"
7" AND CA$<>"8" AND CA$<>"9" THE
N CB$="BROWNIES"
160 GOTO 100
170 ' LIST RECIPE
180 CLS:PRINT@10,"LIST RECIPE":P
RINT@64,"CATAGORY: ";CB$:PRINT:I
F LI=30 THEN 200
190 FOR I=1 TO LI-1:PRINT W$(I):
FOR D=1 TO 400:NEXT D:NEXT I:GOT
O 210
200 FOR I=1 TO LI:PRINT W$(I):FO
R D=1 TO 400:NEXT D:NEXT I
210 PRINT:PRINT@452,"PRESS ANY K
EY TO RETURN";:A$=INKEY$:IF A$="
" THEN 210 ELSE GOTO 40
220 ' PRINT RECIPE
230 CLS:PRINT@9,"PRINT RECIPE":P
RINT@228,"PRESS <CLEAR> TO PRINT
"
240 A$=INKEY$:IF A$=CHR$(12) THE
N 250 ELSE 240
250 CLS:PRINT@234,"PRINTING...":
PRINT#-2,"-------------------":P
RINT#-2,"!                  \":P
RINT#-2,"!";TAB(4);CB$;TAB(20);"
\":PRINT#-2,"!
  \":PRINT#-2,"!
     ---------------------------
--"
260 PRINT#-2,"!";TAB(50);"!":IF
LI>16 THEN 310
270 FOR I=1 TO LI-1:PRINT#-2,"!
 ";W$(I);TAB(50);"!":NEXT I:IF L
I=1 THEN LM=15 ELSE IF LI=2 THEN
 LM=14 ELSE IF LI=3 THEN LM=13 E
LSE IF LI=4 THEN LM=12 ELSE IF L
I=5 THEN LM=11 ELSE IF LI=6 THEN
 LM=10 ELSE IF LI=7 THEN LM=9 EL
SE IF LI=8 THEN LM=8
280 IF LI=9 THEN LM=7 ELSE IF LI
=10 THEN LM=6 ELSE IF LI=11 THEN
 LM=5 ELSE IF LI=12 THEN LM=4 EL
SE IF LI=13 THEN LM=3 ELSE IF LI
=14 THEN LM=2 ELSE IF LI=15 THEN
 LM=1 ELSE IF LI=16 THEN 300
290 FOR I=1 TO LM:PRINT#-2,"!";T
```

```
AB(50);"!":NEXT I
300 PRINT#-2,"!";TAB(50);"!":PRI
NT#-2,"-------------------------
--------------------------":GOTO
 40
310 FOR I=1 TO 15:PRINT#-2,"!  "
;W$(I);TAB(50);"!":NEXT I:PRINT#
-2,"!";TAB(50);"!":PRINT#-2,"---
--------------------------------
----------------":PRINT#-2,"!";T
AB(50);"!"
320 FOR I=16 TO LI-1:PRINT#-2,"!
 ";W$(I);TAB(50);"!":NEXT I:IF
LI=17 THEN LM=14 ELSE IF LI=18 T
HEN LM=13 ELSE IF LI=19 THEN LM=
12 ELSE IF LI=20 THEN LM=11 ELSE
 IF LI=21 THEN LM=10 ELSE
330 IF LI=23 THEN LM=8 ELSE IF L
I=24 THEN LM=7 ELSE IF LI=25 THE
N LM=6 ELSE IF LI=26 THEN LM=5 E
LSE IF LI=27 THEN LM=4 ELSE IF L
I=28 THEN LM=3 ELSE IF LI=29 THE
N LM=2 ELSE IF LI=30 THEN LM=1 E
LSE IF LI=31 THEN 300
340 FOR I=1 TO LM:PRINT#-2,"!";T
AB(50);"!":NEXT I
350 GOTO 300
360 ' SAVE RECIPE
370 CLS:PRINT@10,"SAVE RECIPE":P
RINT:LINE INPUT "NAME OF FILE: "
;F$
380 PRINT@228,"PRESS <ENTER> TO
SAVE.":A$=INKEY$:IF A$=CHR$(13)
THEN 390 ELSE 380
390 CLS:PRINT@234,"SAVING...":OP
EN "O",#1,F$:PRINT "CATEGORY:";C
B$:WRITE #1,CB$:IF LI=30 THEN 41
0
400 FOR I=1 TO LI-1:WRITE #1,W$(
I):NEXT I:GOTO 420
410 FOR I=1 TO LI:WRITE #1,W$(I)
:NEXT I
420 CLOSE #1:PRINT "GOT IT!":FOR
 D=1 TO 500:NEXT D:GOTO 40
430 ' LOAD RECIPE
440 CLS:PRINT@10,"LOAD RECIPE":P
RINT:LINE INPUT "NAME OF FILE: "
;F$
450 PRINT@228,"PRESS <ENTER> TO
LOAD.":A$=INKEY$:IF A$=CHR$(13)
THEN 460 ELSE 450
460 CLS:PRINT@233,"LOADING...":O
PEN "I",#1,F$:LI=1:INPUT #1,CB$:
PRINT "CATEGORY: ";CB$
470 IF EOF(1) THEN 490
480 INPUT #1,W$(LI):PRINT W$(LI)
:LI=LI+1:GOTO 470
490 CLOSE #1:PRINT:PRINT "GOT IT
!":PRINT
500 PRINT@452,"PRESS ANY KEY TO
RETURN":A$=INKEY$:IF A$="" THEN
500 ELSE 40
510 ' EDIT RECIPE
520 CLS:PRINT@10,"EDIT RECIPE":P
RINT@64,"OPTIONS:":PRINT@128,"1>
 CHANGE CATEGORY":PRINT "2> EDIT
 A LINE":PRINT@224,"SELECT:"
530 A$=INKEY$:IF A$="1" THEN 540
 ELSE IF A$="2" THEN 550 ELSE 53
0
540 CLS:PRINT "OLD CATEGORY: ";C
B$:LINE INPUT "NEW CATEGORY: ";C
B$:GOTO 40
550 CLS:IF LI=30 THEN 570
560 FOR I=1 TO LI-1:PRINT I;") "
;:PRINT W$(I):FOR D=1 TO 400:NEX
T D:NEXT I:GOTO 580
570 FOR I=1 TO LI:PRINT I;") ";:
PRINT W$(I):FOR D=1 TO 400:NEXT
D:NEXT I
580 PRINT:LINE INPUT "WHICH LINE
:";L$:IF VAL(L$)>30 THEN 580
590 PRINT L$;"> ";W$(VAL(L$)):PR
INT L$;"> ";:LINE INPUT "";W$(VA
L(L$))
600 GOTO 40
```

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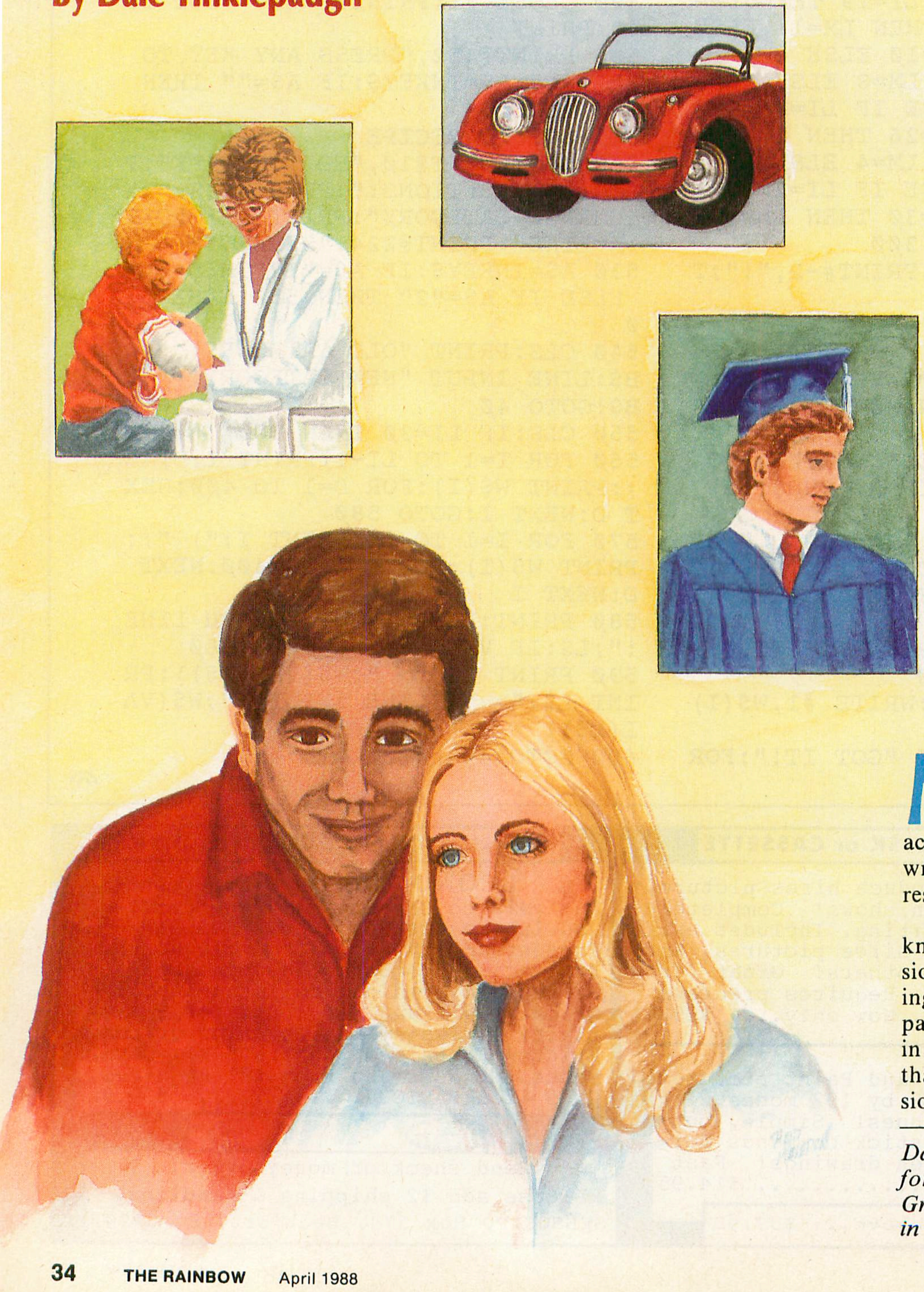
# Financial Time Conversions

## By Dale Tinklepaugh



Money is a subject of vital interest to most people. And while there is more to life than the acquisition of wealth, there is nothing wrong with managing our financial resources wisely.

Good management requires accurate knowledge upon which to base decisions. To compare investment or financing alternatives, it is necessary to compare their value or cost at the same point in time. This article describes a program that performs the types of time conversions needed to do these comparisons.

---

*Dale Tinklepaugh is a software engineer for Hughes Aircraft Radar Systems Group and is pursuing a master's degree in computer engineering at USC.*

The program begins with a main menu and four entries: Present Value, Uniform Series Value, Future Value and Interest Rate Conversions. To compute a present dollar amount, select the first menu entry by pressing the 1 key and then ENTER. A secondary menu then pops up, allowing conversion from a uniform series, a gradient series, a proportional series, or a future amount.

Similarly, the second and third main menu selections allow you to convert to uniform series values and future values, respectively. The fourth main menu selection allows you to convert between nominal annual and effective annual interest rates.

**Present Value of Uniform Series**

A uniform series is a set of equal payments for a number of time periods at a given rate of interest. Conversion from a uniform series to a present value is useful for determining how much money can be borrowed at a certain interest rate without overrunning your budget.

For example, consider Harvey and Bridget, a couple who want to purchase a house. They can afford payments of $900 per month. After choosing the Uniform Series option in the Present Value menu, the couple would be prompted for the number of payment periods. For a 30-year loan, they would have 30 x 12 = 360 payment periods. After entering `360` they would be prompted for the interest rate per period. If the prevailing nominal annual interest rate were 12 percent, the periodic rate would be 12% / 12 = 1%. After entering `1` they would be prompted for the periodic amount, for which they would enter `900`.

The result is $87,496.50. So, depending on the amount of cash they have available for the down payment and closing costs, they can look at houses worth up to $90,000 or $95,000.

Note that in arriving at the monthly amount they can afford for a mortgage payment, the couple had to remember that there are other ownership costs besides the mortgage. Most significant are taxes and insurance. For an older home they would also want to budget a certain amount for maintenance and renovation. On the other side of the budgetary scale is the federal income tax savings resulting from interest payments and property taxes.

**Present Value of Gradient Series**

The next option in the Present Value menu, Gradient Series, begins with a payment of $0 and increases by a fixed amount each period.

An example involving a gradient series is the calculation of the present value of the anticipated maintenance costs for an automobile. Suppose the owner's records indicate repair costs now average nearly $50 a month and seem to be increasing at about $2 per month. How much money would the owner have to put into his 7 percent savings account in order to cover all anticipated repairs for the next four years?

The costs can be broken into two parts. First, there is a uniform series of $50 per month for 48 months at 7 percent annual or 0.583 percent monthly interest. This part can be solved in the same manner as the example above. To cover the $50 per month, the program tells us the owner needs $2,088.17 in his savings account.

Second, there is a gradient series for 48 months, increasing by $2 a month. The program will ask for the periodic increase instead of a periodic amount as in the uniform series. The present value of this gradient series is $1,869.82. The total the owner would need to deposit is $3,957.99.

The confidence in the program output should be no greater than the confidence in the input data. The last example was done using estimates of unknown reliability. The actual costs could be much different for this particular car than would be predicted on the basis of its prior performance or of the performance of other cars of the same make.

If this were the owner of a fleet of taxicabs or commercial trucks, however, the chance variations in cost would tend to average out for the group. Therefore, the owner can know the present cost of maintaining his fleet and compare that with the cost of replacing it.

**Present Value of Future Amount**

An example of conversion of a future amount to a present amount involves the future trade-in value of a car. Harvey has learned that the kind of car he wants typically depreciates about 75 percent in four years. If that car lists for $10,000 today, it will be worth about $2,500 after four years of average use. To see how $2,500 four years from now compares with $2,500 now, evaluate the present value of $2,500 at 9 percent annual interest for 48 months. The interest rate should be that paid by an investment that could be made if the money were not tied up in the car. The monthly interest rate is .09/12 = .75 percent. The correct answer is $1,746.54.

**Uniform Series Value of a Present Sum**

To determine the monthly payment for a loan, choose the Uniform Series Value of a Present Sum. This option can be used for annuities or other types of transactions, also. It has been labeled "Loan" because that is its most likely use. After the number of payment periods, interest rate per period and initial amount are entered, the program displays the uniform payment amount.

For example, the monthly payment on the $10,000 car mentioned above is computed by selecting Option 2, Uniform Series Value, from the main menu and then selecting Option 1, Present Sum (Loan), from the secondary menu. Enter `48` for the number of pay periods, `1` for the interest rate per period and `8000` for the initial amount (allowing for $2,000 down). The uniform monthly payment displayed is $210.67.

**Present Value of a Proportional Series**

A proportional series is one in which the ratio of each payment to its predecessor is constant. One application for this conversion is the calculation of the present worth of a person's estimated lifetime earnings.

For example, Harvey will earn $25,000 this year and expects raises to average about 5 percent a year. Since he is 25 years old, he expects to work 40 more years before retiring. He goes to his computer, runs this program, and selects Present Value of a Proportional Series.

When the program asks for the number of periods, he enters `40`. The interest rate per period should be a rate that could be earned by a prudent but not overly cautious investor. Here we are talking about investing a large sum such as a life insurance settlement or court judgment based on permanent disability. We would not expect it all to be deposited in a passbook savings account. Harvey decides that 10 percent would be reasonable and enters `10`. For rate of increase he enters 5. Next, he enters the first period amount, `25000`. The program displays the answer, $422,225.98.

It is interesting to note the effects of varying the *interest rate* and rate of annual increase on the answer. A higher interest rate reduces the answer, and a higher annual raise increases it.

**Interest Rate Conversions**

There are two kinds of annual interest rates, nominal and effective. They are the same if the interest is compounded once a year. If not, the effective annual rate is derived as in the following example: If the nominal annual rate is 18 percent, the monthly rate is .18/12 = 1.5 percent. The effective rate is obtained by computing (1.015*12)-1 = 19.56181715%, which is the equivalent interest rate with annual compounding

To get the above result using the program, select the Nominal to Effective conversion, enter `12` for the number of compounding periods, and enter `18` for the nominal annual rate.

This can be checked by selecting the Effective to Nominal conversion and entering `12` and `19.56181715` when prompted. The answer is 18. Compounding may be less frequent (quarterly) or more frequent (daily). A special case is called continuous compounding. For this case, entering `0` for the number of compounding periods per year causes the program to branch to use a different formula from that used for a finite number of periods.

```
UNIFORM SERIES VALUE OF
PRESENT SUM

NUMBER OF PERIODS? 120
INTEREST RATE/PERIOD (%)? .8
PRESENT SUM? 12000
UNIFORM VALUE IS:
    $155.93
DO ANOTHER (Y OR N)?
```

```
FUTURE VALUE OF PRESENT SUM

NUMBER OF PERIODS? 96
INTEREST RATE/PERIOD? .6
PRESENT SUM? 1000
FUTURE VALUE IS:
   $1775.85
DO ANOTHER (Y OR N)?
```

**Summary**

The rest of the conversion options are similar to those we have discussed, and involve the same concepts. This program is intended to be your personal finance tool box. You can customize any or all subroutines for your personal use. The program has been written more for readability and flexibility at the expense of memory. By leaving out comments and combining more statements onto one line, it should be possible to squeeze this program into 16K. If you do this, you will need to delete `H4000+` from lines 105 and 125, and change `H7F00` to `H3F00` in Line 140. You may want to check your printer status directly instead of asking the user. The program is written for the DMP-105 printer from Radio Shack. The baud rate is set to 2400 in Line 107.

If you want to do only one or two of the conversions, you can type in just the relevent sections of the program. Comments are included in the program listing to identify subroutine functions. The mathematical formula for each conversion is usually accomplished in two or three program lines, so these subroutines should be easy to customize to your system and applications.

*(Questions or comments may be directed to the author at 14684 Joshua Tree Ave., Sunnymead, CA 92388. Please enclose an SASE when writing for a reply.)* ☐

**Reference**

*Smith, G.W. Engineering Economy: Analysis of Capital Expenditures, 2nd Edition, Iowa State University Press, Ames, Iowa, 1973.*

| | | | |
|---|---|---|---|
| 205 | 174 | 2840 | 214 |
| 1020 | 142 | 3050 | 178 |
| 1290 | 186 | 3420 | 31 |
| 1460 | 103 | 3640 | 179 |
| 1675 | 117 | 4315 | 201 |
| 1815 | 193 | 4620 | 15 |
| 2090 | 24 | END | 225 |
| 2600 | 192 | | |

**The listing:** `FINANCE`

```
100 ' FINANCIAL TIME VALUE CONVE
RSIONS
105 CLEAR 200,&H4000+16127  'SAV
E SPACE FOR TEXT DUMP CODE
107 POKE 150,18  'SET PRINTER TO
 2400
108 ' TEXT DUMP ROUTINE
110 DATA &H86,&HFE,&HB7,0,&H6F,&
H8E,4,0,&H5F,&H5C,&HA6,&H80,&H81
,&H60
115 DATA &H2B,2,&H84,&HBF,&HAD,&
H9F,&HA0,2,&HC1,&H20,&H2B,&HEF,&
H86,&H0D
120 DATA &HAD,&H9F,&HA0,2,&H8C,6
,0,&H2B,&HE3,&H7F,0,&H6F,&H39
125 FOR I=&H4000+16128 TO &H4000
+16128+40
130 READ A:POKE I,A
135 NEXT I
140 DEFUSR0=&H7F00
142 CLS:PRINT"ARE YOU USING A PR
INTER?(Y OR N)";
143 Q$=INKEY$:IF Q$="" GOTO 143
145 IF Q$="Y" THEN QQ=1 ELSE QQ=
0
147 PRINT
150 IF QQ=1 THEN PRINT "TYPE P T
O PRINT RESULTS AFTER A CONVERSI
ON, THEN TYPE Y OR N AS":PRINT"P
ROMPT REQUESTED.":PRINT:PRINT"HI
T ANY KEY TO CONTINUE"
170 IF QQ=1 THEN A$=INKEY$:IF A$
=""GOTO 170
205 F1$="$$######.##":P$="PRESE
NT VALUE IS: ":U$="UNIFORM VALUE
 IS: ":F$="FUTURE VALUE IS: "
210 CLS
230 PRINT@5,"FINANCIAL CONVERSIO
NS"
240 PRINT@70,"BY DALE TINKLEPAUG
H"
```

```
250 PRINT@131,"SELECT CONVERSION
 RESULT"
260 PRINT@197,"1 PRESENT VALUE"
270 PRINT@229,"2 UNIFORM SERIES
VALUE"
280 PRINT@261,"3 FUTURE VALUE"
290 PRINT@293,"4 INTEREST RATE"
300 PRINT@385,"PRESS A NUMBER BE
TWEEN 1 AND 4"
310 A$=INKEY$:IF A$=""GOTO 310
320 CASE=INSTR(1,"1234",A$)
330 ON CASE GOSUB 1000,2000,3000
,4000
340 GOTO 210
1000 'MENU FOR PRESENT VALUE
1010 CLS
1020 PRINT@64,"WHICH WOULD YOU L
IKE TO CONVERT"
1030 PRINT@96,"TO A PRESENT VALU
E?"
1040 PRINT@165,"1 UNIFORM SERIES
"
1050 PRINT@197,"2 GRADIENT SERIE
S"
1060 PRINT@229,"3 PROPORTIONAL S
ERIES"
1070 PRINT@261,"4 FUTURE SUM"
1080 PRINT@293,"5 RETURN TO MAIN
 MENU"
1090 PRINT@385,"PRESS A NUMBER B
ETWEEN 1 AND 5"
1100 A$=INKEY$:IF A$=""GOTO 1100
1110 IF A$="5" THEN RETURN
1120 CASE=INSTR(1,"1234",A$)
1130 ON CASE GOSUB 1200,1400,160
0,1800
1140 GOTO 1000
1200 'PRESENT VALUE OF UNIFORM S
ERIES
1210 CLS
1215 PRINT"PRESENT VALUE OF UNIF
ORM SERIES":PRINT
1220 INPUT"NUMBER OF PERIODS";N
1230 INPUT "INTEREST RATE/PERIOD
(%)";IP
1240 I=IP/100
1250 INPUT "PERIODIC AMOUNT";A
1260 Q=(1+I)^N
1270 PA=(Q-1)/(I*Q)
1280 P=PA*A
1285 PRINT P$
1290 PRINT USING F1$;P
1300 PRINT"DO ANOTHER? (Y OR N)"
;
1305 A$=INKEY$:IF A$=""GOTO 1305
1307 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
1310 IF A$="Y" THEN GOTO 1210 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 1305
```

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```
1400 'PRESENT VALUE OF GRADIENT
SERIES
1405 CLS
1407 PRINT"PRESENT VALUE OF GRAD
IENT":PRINT"SERIES":PRINT
1410 INPUT"NUMBER OF PERIODS";N
1415 INPUT "INTEREST RATE/PERIOD
(%)";IP
1420 I=IP/100
1425 INPUT"PERIODIC INCREASE ($)
";G
1430 Q=(1+I)^N
1435 A=(Q-1)/(I*Q)
1440 B=N/Q
1445 R=(A-B)/I
1450 P=R*G
1455 PRINT P$:PRINTUSING F1$;P
1460 PRINT"DO ANOTHER? (Y OR N)"
;
1462 A$=INKEY$:IF A$="" THEN GOT
O 1462
1463 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
1464 IF A$="Y" AND QQ=1 THEN 140
5 ELSE IF A$="N" THEN RETURN ELS
E GOTO 1462
1465 RETURN
1600 'PRESENT VALUE OF PROPORTIO
NAL SERIES
1605 CLS
1607 PRINT"PRESENT VALUE OF PROP
ORTIONAL":PRINT"SERIES":PRINT
1610 INPUT "NUMBER OF PERIODS";N
1615 INPUT"INTEREST RATE/PERIOD(
%)";IP
1620 I=IP/100
1625 INPUT "RATE OF INCREASE(%)"
;RP
1630 R=RP/100
1635 INPUT"FIRST PERIOD AMOUNT";
C
1640 Q=I+1
1645 IF R=I THEN 1705 ELSE IF R<
I THEN 1675 ELSE 1650
1650 ' R>I
1655 X=((1+R)/Q)-1
1660 FA=(((X+1)^N)-1)/X
1665 PC=FA/Q
1670 GOTO 1715
1675 ' R<I
1680 X=(Q/(1+R))-1
1685 QX=(1+X)^N
1690 PA=(QX-1)/(X*QX)
1695 PC=PA/(1+R)
1700 GOTO 1715
1705 ' R=I
1710 PC=N/Q
1715 ' FINAL COMPUTATION
1720 P=C*PC
1725 PRINT P$:PRINTUSING F1$;P
1727 PRINT"DO ANOTHER? (Y OR N)"
;
1730 A$=INKEY$:IF A$=""THEN GOTO
 1730
1732 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
1734 IF A$="Y" THEN GOTO 1605 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 1730
1735 RETURN
1800 'PRESENT VALUE OF FUTURE SU
M
1805 CLS
1807 PRINT"PRESENT VALUE OF FUTU
RE SUM":PRINT
1810 INPUT "NUMBER OF PERIODS";N
1815 INPUT"INTEREST RATE/PERIOD
(%)";IP
1820 I=IP/100
1825 INPUT"FUTURE SUM";F
1830 PF=1/(1+I)^N
1835 P=F*PF
1840 PRINT P$:PRINTUSING F1$;P
1842 PRINT"DO ANOTHER? (Y OR N)"
;
1845 A$=INKEY$:IF A$="" THEN GOT
O 1845
1847 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
1849 IF A$="Y" THEN GOTO 1805 EL
SE IFA$="N" THEN RETURN ELSE GOT
O 1845
2000 'MENU FOR UNIFORM SERIES VA
LUE
2010 CLS
2020 PRINT@64,"WHICH WOULD YOU L
IKE TO CONVERT"
2030 PRINT@96,"TO A UNIFORM SERI
ES VALUE?"
2040 PRINT@165,"1 PRESENT SUM (L
OAN)"
2050 PRINT@197,"2 GRADIENT SERIE
S"
2060 PRINT@229,"3 FUTURE SUM"
2070 PRINT@261,"4 RETURN TO MAIN
 MENU"
2080 PRINT@353,"PRESS A NUMBER B
ETWEEN 1 AND 4"
2090 A$=INKEY$:IF A$=""GOTO 2090
2100 IF A$="4" THEN RETURN ELSE
CASE=INSTR(1,"123",A$)
2110 ON CASE GOSUB 2200,2600,280
0
2120 GOTO 2000
2200 'UNIFORM SERIES VALUE OF PR
ESENT SUM
2205 CLS
2207 PRINT"UNIFORM SERIES VALUE
OF PRESENT":PRINT"SUM":PRINT
2210 INPUT"NUMBER OF PERIODS";N
2215 INPUT "INTEREST RATE/PERIOD
 (%)";IP
```

```
2220 I=IP/100
2225 INPUT"PRESENT SUM";P
2230 Q=(1+I)^N
2235 R=I*Q/(Q-1)
2240 A=R*P
2245 PRINT U$:PRINTUSING F1$;A
2247 PRINT"DO ANOTHER (Y OR N)?"
2250 A$=INKEY$:IF A$="" THEN GOT
O 2250
2252 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
2255 IF A$="Y" THEN GOTO 2250 EL
SE RETURN
2600 'UNIFORM SERIES VALUE OF GR
ADIENT SERIES
2605 CLS
2607 PRINT"UNIFORM SERIES VALUE
OF GRADIENT":PRINT"SERIES":PRINT
2610 INPUT "NUMBER OF PERIODS";N
2615 INPUT"INTEREST RATE/PERIOD
(%)";IP
2620 I=IP/100
2625 INPUT"PERIODIC INCREASE";G
2630 AG=(1/I)-N/(((1+I)^N)-1)
2635 A=G*AG
2640 PRINT U$:PRINTUSING F1$;A
2645 PRINT"DO ANOTHER (Y OR N)?"
;
2650 A$=INKEY$:IF A$="" GOTO 265
0
2652 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
2655 IF A$="Y" THEN GOTO 2605 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 2650
2800 'UNIFORM SERIES VALUE OF FU
TURE SUM
2805 CLS
2807 PRINT"UNIFORM SERIES VALUE
OF FUTURE":PRINT"SUM":PRINT
2810 INPUT"NUMBER OF PERIODS";N
2815 INPUT"INTEREST RATE/PERIOD
(%)";IP
2820 I=IP/100
2825 INPUT"FUTURE SUM";F
2830 AF=I/(((1+I)^N)-1)
2835 A=AF*F
2840 PRINT U$:PRINTUSING F1$;A
2845 PRINT"DO ANOTHER (Y OR N)?"
;
2850 A$=INKEY$:IF A$="" GOTO 285
0
2852 IF A$="P"AND QQ=1 THEN A=US
R0(0)
2855 IF A$="Y" THEN GOTO 2805 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 2850
3000 'MENU FOR FUTURE VALUE
3005 CLS
3010 PRINT@64,"WHICH WOULD YOU L
IKE TO CONVERT"
3015 PRINT@96,"TO A FUTURE VALUE
?"
3020 PRINT@165,"1 PRESENT SUM"
3025 PRINT@197,"2 UNIFORM SERIES
"
3030 PRINT@229,"3 GRADIENT SERIE
S"
3035 PRINT@261,"4 RETURN TO MAIN
 MENU"
3040 PRINT@353,"PRESS A NUMBER B
ETWEEN 1 AND 4"
3045 A$=INKEY$:IF A$=""GOTO 3045
3050 IF A$="4" THEN RETURN ELSE
CASE=INSTR(1,"123",A$)
3055 ON CASE GOSUB 3200,3400,360
0
3060 GOTO 3000
3200 'FUTURE VALUE OF PRESENT SU
M
3205 CLS
3207 PRINT"FUTURE VALUE OF PRESE
NT SUM":PRINT
3210 INPUT"NUMBER OF PERIODS";N
3215 INPUT"INTEREST RATE/PERIOD"
;IP
3220 I=IP/100
3225 INPUT"PRESENT SUM";P
3230 FP=(1+I)^N
3235 F=FP*P
3240 PRINT F$:PRINTUSING F1$;F
```

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```
3245 PRINT"DO ANOTHER (Y OR N)?"
;
3250 A$=INKEY$:IF A$="" GOTO 325
0
3252 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
3255 IF A$="Y" THEN GOTO 3205 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 3250
3400 'FUTURE VALUE OF UNIFORM SE
RIES
3405 CLS
3407 PRINT"FUTURE VALUE OF UNIFO
RM SERIES":PRINT
3410 INPUT"NUMBER OF PERIODS";N
3415 INPUT"INTEREST RATE/PERIOD
(%)";IP
3420 I=IP/100
3425 INPUT"PERIODIC AMOUNT";A
3430 FA=(((1+I)^N)-1)/I
3435 F=FA*A
3440 PRINT F$:PRINTUSING F1$;F
3445 PRINT"DO ANOTHER (Y OR N)?"
;
3450 A$=INKEY$:IF A$="" GOTO 345
0
3452 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
3455 IF A$="Y"THEN GOTO 3405 ELS
E IF A$="N" THEN RETURN ELSE GOT
O 3450
3600 'FUTURE VALUE OF GRADIENT S
ERIES
3605 CLS
3607 PRINT"FUTURE VALUE OF GRADI
ENT SERIES":PRINT
3610 INPUT"NUMBER OF PERIODS";N
3615 INPUT"INTEREST RATE/PERIOD
(%)";IP
3620 I=IP/100
3625 INPUT"PERIODIC INCREASE";G
3630 FG=(((((1+I)^N)-1)/I)-N)/I
3635 F=FG*G
3640 PRINT F$:PRINTUSING F1$;F
3645 PRINT"DO ANOTHER (Y OR N)?"
;
3650 A$=INKEY$:IF A$=""GOTO 3650
3652 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
3655 IF A$="Y" THEN GOTO 3605 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 3650
4000 'MENU FOR INTEREST RATE CON
VERSIONS
4010 CLS
4020 PRINT@64,"WOULD YOU LIKE TO
 CONVERT:"
4030 PRINT@165,"1 NOMINAL ANNUAL
 RATE TO"
4040 PRINT@197,"  EFFECTIVE ANNU
AL RATE"
4050 PRINT@229,"2 EFFECTIVE ANNU
AL RATE TO"
4060 PRINT@261,"  NOMINAL ANNUAL
 RATE"
4070 PRINT@293,"3 RETURN TO MAIN
 MENU"
4080 PRINT@385,"PRESS A NUMBER B
ETWEEN 1 AND 3"
4090 A$=INKEY$:IF A$=""GOTO 4090
4100 IF A$="3" THEN RETURN ELSE
CASE=INSTR(1,"12",A$)
4110 ON CASE GOSUB 4300,4600
4120 GOTO 4000
4300 'NOMINAL TO EFFECTIVE
4310 CLS
4315 PRINT"NOMINAL TO EFFECTIVE"
:PRINT
4320 PRINT"NUMBER OF COMPOUNDING
":PRINT"PERIODS/YEAR"
4340 INPUT"(FOR CONTINUOUS INPUT
 0)";M
4350 INPUT"NOMINAL ANNUAL RATE";
IP
4355 I=IP/100
4360 IF M=0 THEN 4380
4370 IA=(1+I/M)^M-1:GOTO 4390
4380 IA=EXP(I)-1
4390 PRINT"EFFECTIVE ANNUAL RATE
 IS:":PRINTIA*100;"%"
4400 PRINT"DO ANOTHER (Y OR N)?"
;
4410 A$=INKEY$:IF A$="" GOTO 441
0
4415 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
4420 IF A$="Y" THEN GOTO 4310 EL
SE IF A$="N" THEN RETURN ELSE GO
TO 4410
4600 'EFFECTIVE TO NOMINAL
4610 CLS
4615 PRINT"EFFECTIVE TO NOMINAL"
:PRINT
4620 PRINT"NUMBER OF COMPOUNDING
":PRINT"PERIODS/YEAR"
4630 INPUT"(FOR CONTINUOUS, INPU
T 0)";M
4640 INPUT"EFFECTIVE ANNUAL RATE
";IP
4650 IA=IP/100
4660 IF M=0 THEN GOTO 4690
4670 I=(1+IA)^(1/M)-1
4680 NI=I*M:GOTO 4700
4690 NI=LOG(1+IA)
4700 PRINT"NOMINAL ANNUAL RATE I
S:":PRINTNI*100;"%"
4710 PRINT"DO ANOTHER (Y OR N)?"
;
4720 A$=INKEY$:IF A$=""GOTO 4720
4725 IF A$="P" AND QQ=1 THEN A=U
SR0(0)
4730 IF A$="Y"THEN GOTO 4610 ELS
E IF A$="N" THEN RETURN ELSE GOT
O 4720
```

# Still pounding away at that keyboard?

The RAINBOW
THE COLOR COMPUTER MONTHLY MAGAZINE
RAINBOW ON DISK
RAINBOW on tape
FEBRUARY
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Keep track of your valuables and their I.D. numbers

# Home Inventory Manager

By Bill Tottingham

You have just arrived home after a crime prevention seminar in time to notice a couple of hairy thugs in a moving van driving off with what seems to be all your prize possessions. Indeed, upon examination of your abode, you come to the conclusion that you have been robbed.

The police are very helpful, checking for fingerprints and such, and finally asking you for a list of the stolen items and their serial numbers. You immediately give them a printout of these items . . . *What?* . . . *No list?*

---

*Bill lives in Milton, Wisconsin, and is a free-lance programmer, an auto body worker and a programming consultant to high-tech developments.*

Unfortunately, this scenario is not uncommon, and anyone who has experienced it knows that without a list of items and their serial numbers, your chances of ever recovering your possessions are greatly diminished. What's more, many insurance companies now require such a list before they pay off.

*Home Inventory File* may be your answer. The program keeps track of all your items, their serial numbers, their brand names, their value, and any specific information that will make identification easy.

The program works on a 16K ECB machine, tape or disk. If you have a 64K CoCo, you can clear more memory in Line 20 and change the value of `DA` in Line 30 to handle more items. The printer control codes, assigned in lines 1040 through 1070, are set up for the Radio Shack DMP-130.

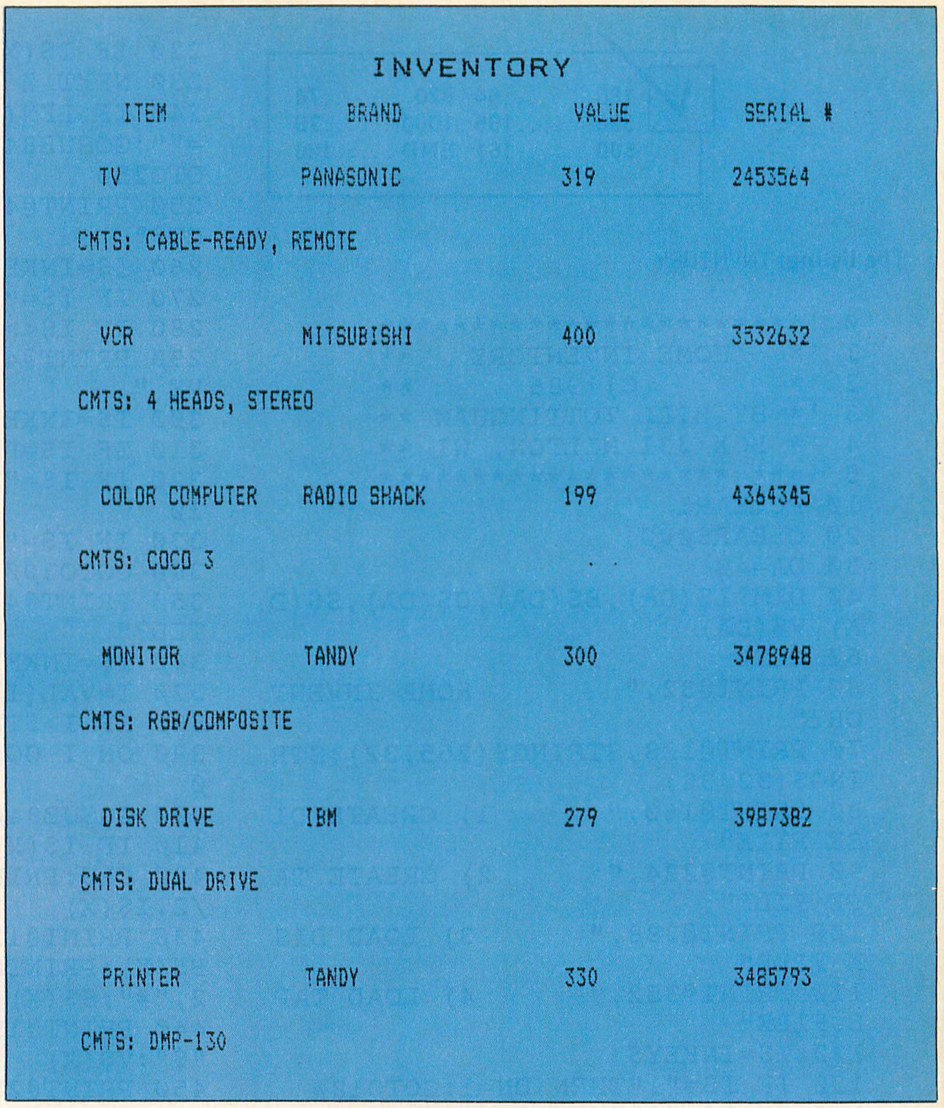
The first screen you see after running the program gives you the option of creating a file for disk or tape or loading a file from disk or tape. As we're just starting, pick "Create File."

Enter the data, keeping the length under 14 characters for each of the first four entries. The fifth entry can be up to 111 characters — this is where you enter any specific information.

After the fifth entry, you are asked if the information is correct. If you answer no (N), you will be asked what line you want to change. After making any necessary changes, answer yes (Y) to the information prompt.

Here you can press A to add another item, S to save to disk or tape, or V for view.

After entering all the items, press S. You will be asked for a filename before operations continue. When you have supplied one, you will be put in the View mode, from which you can print your hard copy, delete an item, add more items, view items (use up and down arrows to scroll through the file), save your file, or quit.



```
                          INVENTORY
     ITEM              BRAND             VALUE          SERIAL #

     TV                PANASONIC         319            2453564

   CMTS: CABLE-READY, REMOTE


     VCR               MITSUBISHI        400            3532632

   CMTS: 4 HEADS, STEREO


     COLOR COMPUTER    RADIO SHACK       199            4364345

   CMTS: COCO 3


     MONITOR           TANDY             300            3478948

   CMTS: RGB/COMPOSITE


     DISK DRIVE        IBM               279            3987382

   CMTS: DUAL DRIVE


     PRINTER           TANDY             330            3485793

   CMTS: DMP-130
```

The View mode is also the mode you enter after loading a file. This is a simple process — from the entry menu just select the load option and respond to the filename prompt.

After you play with the program for a while, you will see how simple it is to use. On a 16K CoCo with disk, you may have to change the value of `DA` in Line 30 to a lower value to avoid an OS Error. Most importantly, don't forget to put your disk and hard copy somewhere safe!

*(Questions or comments about this program may be directed to the author at 3916 Lakeshore Drive, Milton, WI 53563. Please enclose an SASE when writing for a response.)* ☐

*** ASSEMBLY LANGUAGE PROGRAMMING TRS-80 COLOR COMPUTER

THE BOOK

This hands-on guide for the CoCo 1 & 2 begins with the basics and progresses to the expert level. Written as a tutorial; it takes you each step to assembly language programming. Programming guidelines cover subroutines, stack use, and interrupt handlers. All the internal secrets of the SAM, PIA, MPU, memory, graphic display, joysticks, serial port, cassette, disk, keyboard, ROM, and sound are revealed. All this presented in a clear and understandable fashion. The best - excellent reference book - Be a CoCo expert - 289 pages - $18.00 + $1.50 s/h

THE ADDENDUM

This picks up where The Book left off. It describes all the CoCo 3 enhancements and how to use them with assembly language. Wow - what features and many are not explained any place else. Super-Res Graphics - Virtual Memory - New Interrupts - $12.00 + $1.00 s/h

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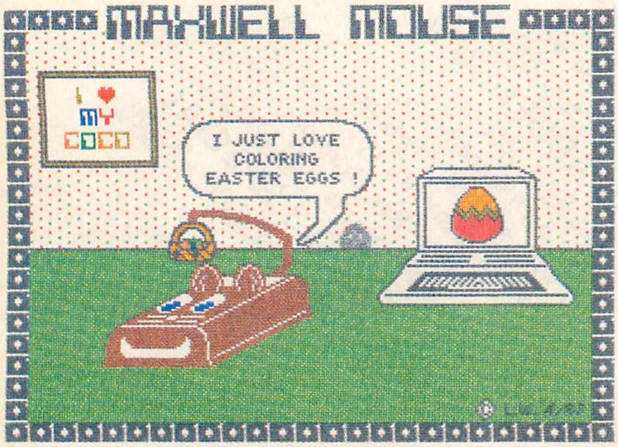
|  |  |  |  |
|---|---|---|---|
| 180 .......64 | 820 .......74 |
| 390 ......135 | 1000 ......79 |
| 580 ......161 | END .....126 |

**The listing:** INVNTORY

```
0 '***********************
1 '*   HOME INVENTORY   **
2 '*       (C)1986      **
3 '* BY BILL TOTTINGHAM **
4 '* BOX 331 MILTON, WI **
5 '***********************
10 PCLEAR1
20 CLEAR5000
30 DA=40
40 DIM I$(DA),B$(DA),C$(DA),S$(D
A),V$(DA)
50 CLS0
60 PRINT@32,"         HOME INVENT
ORY"
70 PRINT@128,STRING$(255,32);STR
ING$(32,32)
80 PRINT@160,"      1) CREATE DI
SK FILE"
90 PRINT@224,"      2) CREATE TA
PE FILE"
100 PRINT@288,"      3) LOAD DIS
K FILE"
110 PRINT@352,"      4) LOAD TAP
E FILE"
120 I$=INKEY$
130 IF I$="1"THEN DN=1:GOTO180
140 IF I$="2"THEN DN=-1:GOTO180
150 IF I$="3"THEN DN=1:GOTO610
160 IF I$="4"THEN DN=-1:GOTO610
170 GOTO120
180 X=1
190 GOSUB840:GOSUB850
200 FORZ=1TO5
210 ON Z GOSUB860,880,900,920,94
0
220 IF I$(X)=""THEN210
230 NEXT Z
240 IF LEN(C$(X))>111 THEN C$(X)
="":GOSUB840:GOSUB850:GOSUB940:G
OTO250
250 PRINT@454,"INFORMATION CORRE
CT?"
260 I$=INKEY$
270 IF I$="N"THEN350
280 IF I$<>"Y"THEN260
290 PRINT@454,"(A)DD (V)IEW (S)A
VE "
300 I$=INKEY$
310 IF I$="A"THENX=X+1:GOTO190
320 IF I$="V"THEN NF=X:X=1:GOTO4
10
330 IF I$="S"THEN NF=X:GOTO560
340 GOTO300
350 PRINT@454,"LINE TO BE CORREC
TED?"
360 I$=INKEY$:IF I$=""THEN360
370 I=VAL(I$):IF I=0 THEN 360
380 IF I>5THEN360
390 ON I GOSUB860,880,900,920,94
0
400 GOSUB840:GOSUB850:GOTO240
410 IF I$(X)=""THEN470
420 CLS:PRINT@32+(32-LEN(I$(X)))
/2,I$(X)
430 PRINT@129+(16-LEN(B$(X)))/2,
B$(X):PRINT@144+(16-LEN(S$(X)))/
2,"#";S$(X)
440 PRINT@191+(32-LEN(V$(X)))/2,
"$";V$(X)
450 PRINT@256,C$(X)
460 PRINT@384,"(D)ELETE (A)DD (H
)ARDCOPY (S)AVE":PRINT@451,"(Q)U
IT   <ARROWS TO SCROLL>"
470 I$=INKEY$:IF I$=""THEN470
480 IF I$=CHR$(94)THENX=X+1:IF X
>NF THEN X=NF ELSE GOTO410:GOTO4
10
490 IF I$=CHR$(10)THEN X=X-1:IF
X<1 THENX=1 ELSE GOTO410:GOTO410
500 IF I$="D"THEN I$(X)="":X=X-1
:IF X<1THEN X=NF ELSE GOTO410:GO
TO410
510 IF I$="H" THEN 1030
520 IF I$="A"THEN X=NF+1:GOTO190
530 IF I$="S"THEN560
540 IF I$="Q" THEN END
550 GOTO470
560 GOSUB960
570 I$=INKEY$:IF I$<>CHR$(13)THE
N570
580 GOSUB740
590 I$=INKEY$:IFI$=""THEN590
600 X=1:GOTO410
610 GOSUB 960
620 I$=INKEY$:IF I$<>CHR$(13)THE
N620
```

## Mouse Tales By Logan Ward


MAXWELL MOUSE
I ♥ MY COCO
I JUST LOVE COLORING EASTER EGGS !

```
630 GOSUB650
640 :X=1:GOTO410
650 'READ FILE
660 X=0
670 OPEN"I",#DN,FILE$
680 X=X+1:NF=X
690 IF EOF(DN) THEN720
700 INPUT#DN,I$(X),B$(X),S$(X),V
$(X),C$(X)
710 IF EOF(DN)=0THEN680
720 CLOSE
730 RETURN
740 'WRITE FILE
750 OPEN"O",#DN,FILE$
760 FOR X=1TO NF
770 IF I$(X)=""THEN810
780 IF DN=1 THEN WRITE #DN,I$(X)
,B$(X),S$(X),V$(X),C$(X)
790 IF DN=-1 THEN PRINT #DN,I$(X
),B$(X),S$(X),V$(X),C$(X)
800 IF X=NF THEN820
810 NEXT X
820 CLOSE
830 RETURN
840 CLS:PRINT@8,"DATA ENTRY/EDIT
":RETURN
850 PRINT@68,"1) ITEM: ";I$(X):P
RINT@132,"2) BRAND: ";B$(X):PRIN
T@196,"3) SERIAL#: ";S$(X):PRINT
@260,"4) VALUE: ";V$(X):PRINT@32
4,"5) COMMENTS: ";C$(X):RETURN
860 PRINT@77,STRING$(LEN(I$(X)),
32):PRINT@77,"";:LINEINPUTI$(X)
870 RETURN
880 PRINT@142,STRING$(LEN(B$(X))
,32):PRINT@142,"";:LINEINPUTB$(X
)
890 RETURN
900 PRINT@208,STRING$(LEN(S$(X))
,32):PRINT@208,"";:LINEINPUTS$(X
)
910 RETURN
920 PRINT@270,STRING$(LEN(V$(X))
,32):PRINT@270,"";:LINEINPUTV$(X
)
930 RETURN
940 PRINT@337,STRING$(LEN(C$(X))
,32):PRINT@337,"";:LINEINPUTC$(X
)
950 RETURN
960 CLS:PRINT@74,"FILE NAME??":P
RINT@106,"";:LINEINPUTFILE$
970 IF FILE$=""THEN960
980 IF LEN(FILE$)>8THEN960
990 IF DN=1THENPRINT@264,"PLACE
DATA DISK":PRINT@298,"IN DRIVE -
0-"
1000 IF DN=-1 THEN PRINT@266,"PO
SITION TAPE":PRINT@294,"PRESS PL
AY & RECORD"
1010 PRINT@460,"<ENTER>"
1020 RETURN
1030 'PRINTER ROUTINE
1040 EO$=CHR$(27)+CHR$(14):'DOUB
LEWIDTH ON
1050 ED$=CHR$(27)+CHR$(15):'DOUB
LEWIDTH OFF
1060 UO$=CHR$(15):'UNDERLINE
1070 UE$=CHR$(14):'END UNDERLINE
1080 CLS:PRINT@37,"POSITION PRIN
TER HEAD":PRINT@364,"<ENTER>"
1090 I$=INKEY$:IF I$<>CHR$(13) T
HEN1090
1100 PRINT#-2,STRING$(5,13)
1110 PRINT#-2,TAB(31);EO$;"INVEN
TORY";ED$;STRING$(3,13)
1120 PRINT#-2,TAB(0);UO$;TAB(80)
;UE$
1130 PRINT#-2,TAB(0);UO$;TAB(10)
;"ITEM";TAB(30);"BRAND";TAB(50);
"VALUE";TAB(65);"SERIAL #";TAB(8
0);UE$
1140 PRINT#-2
1150 FOR X=1TONF
1160 IF I$(X)=""THEN NEXT X
1170 PRINT#-2,TAB(7);I$(X);TAB(2
5);B$(X);TAB(48);V$(X);TAB(63);S
$(X);CHR$(13)
1180 PRINT#-2,TAB(5);"CMTS: ";C$
(X);STRING$(2,13)
1190 NEXT X
1200 X=1:GOTO410
```

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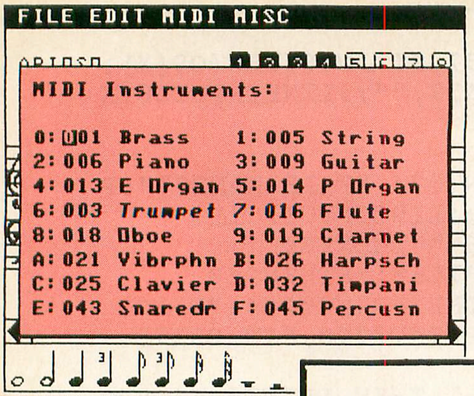

MIDI Instruments:

```
0:001 Brass    1:005 String
2:006 Piano    3:009 Guitar
4:013 E Organ  5:014 P Organ
6:003 Trumpet  7:016 Flute
8:018 Oboe     9:019 Clarnet
A:021 Vibrphn  B:026 Harpsch
C:025 Clavier  D:032 Timpani
E:043 Snaredr  F:045 Percusn
```

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*Coco 1, 2, 3 Compatible*

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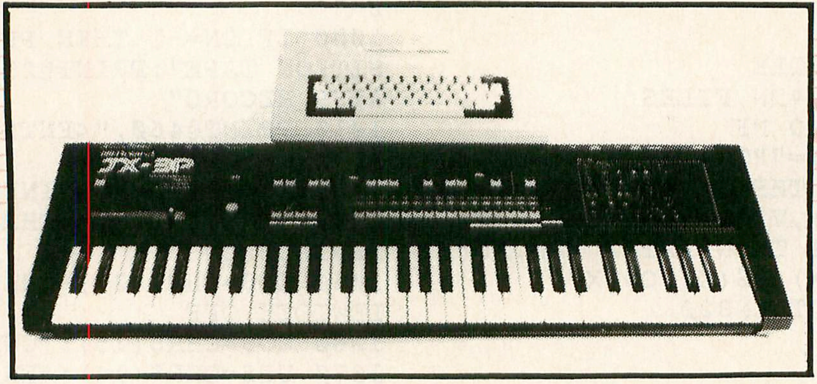

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  - Program change
  - Pitch wheel
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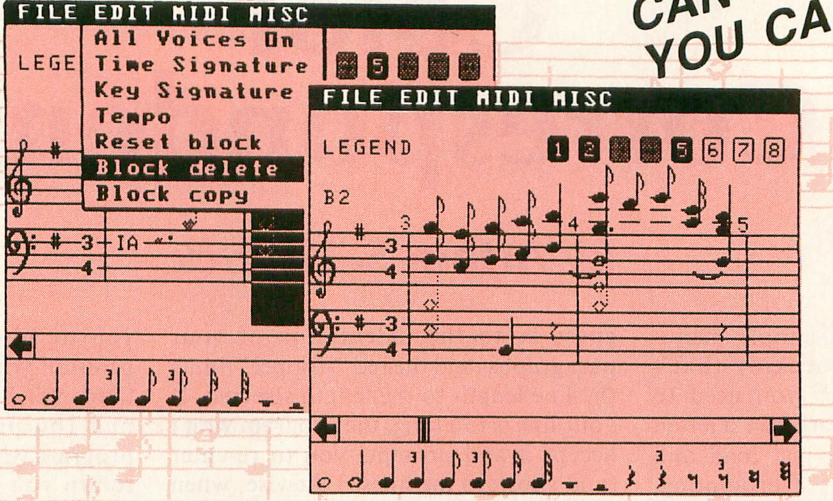

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*Coco 1, 2, 3 Compatible*

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LYRA is the most powerful music composition program we have seen on any computer. We don't mean just the COCO, we really mean any computer. Whether you are a novice trying to learn music or a professional musician with MIDI equipment you will find LYRA a powerful tool. You see, we wrote LYRA for musicians that hate computers. If you want proof, purchase a LYRA demo for $7.95. We will apply the demo price to your purchase. MIDI output requires the LYRA MIDI cable (#MC158) or COCO MIDI Seq/Editor (#CM147).

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  - MIDI Synth
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  - COCO MIDI S/E
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- Output up to 4 voices without additional hardware.
- Output all 8 voices using either SYMPHONY 12 or one or more MIDI synthesizers and drum machines.
- Output any voice on any of the 8 MIDI channels.
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- Each voice may be visually highlighted or erased.
- Each measure is numbered for easy reading.
- Solo capability
- Block edits are highlighted.
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- Name of note pointed to is constantly displayed.
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- Memory remaining clearly displayed, however you will have plenty of memory even for the most demanding piece.
- Help menu makes manual virtually unnecessary.
- LYRA is 100% software, no need for extra hardware unless you want more power.
- Music easily saved to tape or disk.
- Requires 64K and mouse or joystick.

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These LYRA options are **not** required. They are provided for those wishing additional flexibility.

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*A mini word processor for your letter-writing needs*

# Color Correspondent

## By Arthur S. Hallock

*Letter Writer* is a simple menu-driven word processor that's great to use when you need to knock off something short, like a letter.

To use the program, just load and run. It is 99.44 percent self-prompting, and gives a colorful (although perhaps non-professional) screen appearance, while attempting to help you compose a letter (a dying art in itself).

After loading and running, you find yourself at the main menu, presented with eight options:

| | |
|---|---|
| C | Commence a new letter |
| A | Add to an existing letter |
| E | Edit, inquire, view page |
| L | Load page — tape or disk |
| H | Hard copy on printer |
| S | Save page — tape or disk |
| X | Exit — terminate program |
| P | Print: fanfold envelope |

To begin a letter, press C. You must enter the line length of the letter by selecting your margins when prompted. For simplicity's sake, I usually use 8 and 88, giving me an 81-character line, which works well for my DMP-110 printer in its proportional font mode. (This program is presently set up for the Radio Shack DMP-110 at 1200 baud.)

The tab guide helps to educate your guess as to the indentation of your paragraphs, and the red "stopper" limits the line length to the length selected. If your line is too long, the program won't accept it and prompts you to re-enter (and shorten) the lines. Likewise, when in the Edit mode there is a series of dots that assist in the judgment of line length.

The program starts out allowing you to enter 44 lines of text, which just about fill one page if you're using a letterhead. When you reach the limit, the program switches screens and prompts you to request another number of lines. This may be up to 200 lines as the program is written, unless you want to dimension a larger buffer area (`L$` is now dimensioned to 200 in Line 40), and you're returned to the main menu. Press A to add to your letter, starting at Line 45.

The Edit mode allows you to proofread your letter, viewing five lines at a time, as long as the line length is 91 or less. This fills the screen; if you use longer lines, viewing is more difficult as the top lines will be lost.

When used with cassette systems, the program pauses on a screen that allows you to adjust your tape to whatever position you want, and then requests a filename. If, at this point, you enter a null (by pressing ENTER alone), the program will abort the load or save and return you to the main menu. Exiting the program aborts also, unless confirmed by a 'Y' for yes.

If you're using a disk system, you may enter `DIR` at the prompt for the filename to load — this allows you to view the directory. When you're running on disk, of course, you bypass the motor routine for cassette.

Everything else is self-prompting and self-explanatory. Although it was written for the 32K CoCo, with appropriate pruning the program will work in 16K. In either case, the program is very flexible. Unnecessary lines can be left out, and the `INSTR` command can be added to, or subtracted from, quite handily. In that way, you can dedicate the program to 16K, tape or disk, and make room for more text.

Change the printer baud rate in Line 30 to your favorite rate. Lines 1620 and 1730 check that the printer is online.

| | |
|---|---|
| `CHR$(27);CHR$(14)` | start elongation |
| `CHR$(27);CHR$(15)` | end elongation |
| `CHR$(27);CHR$(17)` | select proportional character |
| `CHR$(27);CHR$(19)` | select standard character 10 CPI |
| `CHR$(27);CHR$(20)` | select condensed character 17 CPI |
| `CHR$(27);CHR$(29)` | select elite character 12 CPI |
| `CHR$(27);CHR$(66)` | select italic character |

**Table 1: DMP-110 Printer Control Codes**

---

*Originally trained in electronics, with home courses and 13 years with the Bell Telephone System, Arthur Hallock switched to computers five years ago. He works as a police dispatcher and runs a computer repair service as a hobby.*

The control codes used in this program (see Table 1) are for the Radio Shack DMP-110 printer. Most Radio Shack dot matrix printers will work just fine with these codes. For other printers, you will find the listed control codes in lines 1500, 1590 and many lines from Line 2050 through Line 2360. One final note on control codes. The code `CHR$(12)` appears in several lines in the program. This code is interpreted by nearly every printer to mean "perform a form feed."

To use the envelope routine, just edit `LH$` and `AD$` in lines 2010 and 2020, and adjust the block in lines 1900 through 2370 to read with your name.

As the entire program is written in block form, any area can easily be tailored to your specifications.

*(Questions or comments about this program may be directed to the author at Route 1, Box 198 HHH, Deming, NM 88030. Please enclose an SASE when writing for a reply.)* ☐

| | | | |
|---|---|---|---|
| 180 | 43 | 1570 | 133 |
| 300 | 235 | 1770 | 225 |
| 590 | 171 | 1920 | 42 |
| 820 | 206 | 2150 | 229 |
| 1000 | 234 | 2310 | 205 |
| 1200 | 99 | 2550 | 198 |
| 1390 | 87 | END | 42 |

**The listing:** `LETRRITR`

```
10 GOTO 30       * LETRWRTR/BAS
   14 JAN 84   * ASHALLOCK
30 PCLEAR1:POKE150,41:CLS3 '***
   BAUDRATE SET TO 1200 DMP110*
40 CLEAR10000:DIML$(200)
50 DIMC(180),L(25),M(60),P(60),Q
(60),R(96),Z(96)
90 GOTO2440
100 IF C>0 THEN30ELSE110
110 CLS3:PRINT@33,"** "BK$"start
-up"BK$"routine"BK$" **";:PRINT@
96,STRING$(32,182);:POKE1066,45
120 PRINT@162," WHEN ENTERING TE
XT, ENTER ";:PRINTSTRING$(5,175)
;:PRINT@194,"   A PERIOD ( . ) T
O EXIT  ";
130 P=0:PRINT@258,;:INPUT" ENTER
 LEFT MARGIN ";L:L=L-1:IFL<0 THE
N L=0:PRINT@257,STRING$(5,175);
140 PRINT@258," RIGHT MARGIN MUS
T BE        ";:PRINTSTRING$(5,175)
" EQUAL TO OR LESS THAN 96 ";
150 PRINT@354," ";:INPUT"ENTER R
IGHT MARGIN ";R
160 IFR=0 THEN90ELSEIFR<L THEN15
0ELSE170
```

# SPECIAL EVENT!

## COCO GALLERY LIVE
## SHOWCASE YOUR BEST AT RAINBOWFEST

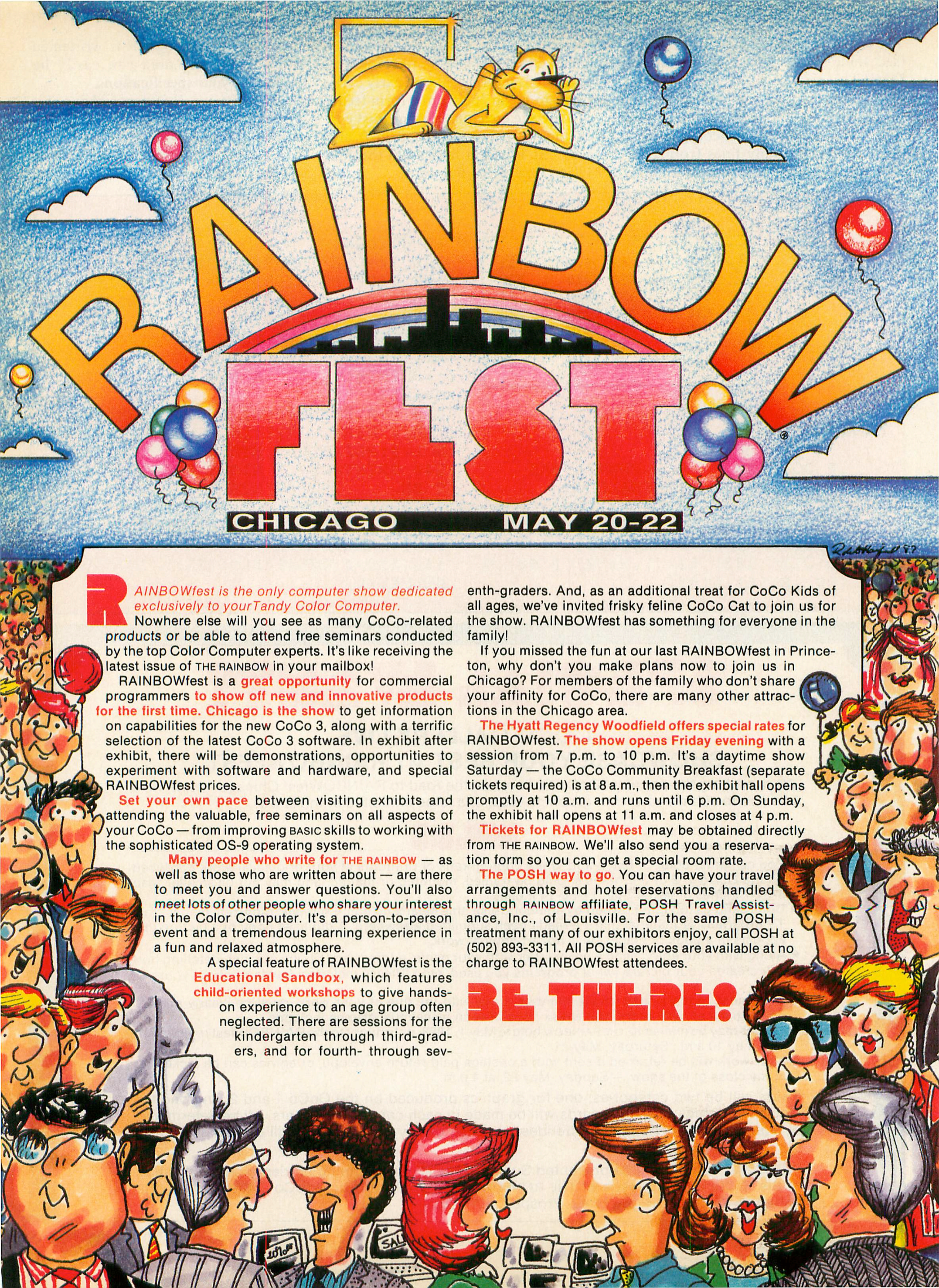
We are taking the popular "CoCo Gallery" on the road to RAINBOWfest Chicago — and we'd like you to submit your own graphics creations to be exhibited at the show!

## RULES

- You can enter color or black-and-white photographs or printouts of your original artwork produced on the CoCo 1, 2 or 3. Entries should be framed, mounted or matted, and may not be smaller than 5-by-7 inches or larger than 11-by-14 inches.
- Don't send us anything owned by someone else; this means no game screens, digitized images from TV programs or material that's already been submitted elsewhere. A digitized copy of a picture that appears in a book or magazine is ***not*** an original work.
- Along with your entry, send a cover letter with your name, address and phone number, detailing how you created your picture (what programs you used, etc.). Please include a few facts about yourself, too!
- Your name, address and phone number, along with the title of your work, must be clearly marked on the back of each entry, and a disk copy of each piece must also be included.
- Entries may be mailed to THE RAINBOW before May 1, 1988, or brought to the RAINBOWfest registration booth by 10 a.m., Saturday, May 21.
- Your work will be returned if sent with a postage paid return envelope, or entries can be picked up at the close of the show — Sunday, May 22, at 4 p.m.

There will be two categories: one for graphics produced on the CoCo 1 and 2, and one for CoCo 3 graphics. Several awards will be made in each category. Winners will be determined by votes from RAINBOWfest attendees. In case of any ties, winners will be determined by our chief judge, CoCo Cat.

Prizes and ribbons will be presented Sunday, May 22, and winning entries will be published in the September '88 issue of THE RAINBOW. Send your entry to "CoCo Gallery Live," THE RAINBOW, 9509 U.S. Highway 42, Prospect, KY 40059.



*RAINBOWfest is the only computer show dedicated exclusively to your Tandy Color Computer.*

Nowhere else will you see as many CoCo-related products or be able to attend free seminars conducted by the top Color Computer experts. It's like receiving the latest issue of THE RAINBOW in your mailbox!

RAINBOWfest is a **great opportunity** for commercial programmers **to show off new and innovative products for the first time. Chicago is the show** to get information on capabilities for the new CoCo 3, along with a terrific selection of the latest CoCo 3 software. In exhibit after exhibit, there will be demonstrations, opportunities to experiment with software and hardware, and special RAINBOWfest prices.

**Set your own pace** between visiting exhibits and attending the valuable, free seminars on all aspects of your CoCo — from improving BASIC skills to working with the sophisticated OS-9 operating system.

**Many people who write for THE RAINBOW** — as well as those who are written about — are there to meet you and answer questions. You'll also meet lots of other people who share your interest in the Color Computer. It's a person-to-person event and a tremendous learning experience in a fun and relaxed atmosphere.

A special feature of RAINBOWfest is the **Educational Sandbox,** which features **child-oriented workshops** to give hands-on experience to an age group often neglected. There are sessions for the kindergarten through third-graders, and for fourth- through seventh-graders. And, as an additional treat for CoCo Kids of all ages, we've invited frisky feline CoCo Cat to join us for the show. RAINBOWfest has something for everyone in the family!

If you missed the fun at our last RAINBOWfest in Princeton, why don't you make plans now to join us in Chicago? For members of the family who don't share your affinity for CoCo, there are many other attractions in the Chicago area.

**The Hyatt Regency Woodfield offers special rates** for RAINBOWfest. **The show opens Friday evening** with a session from 7 p.m. to 10 p.m. It's a daytime show Saturday — the CoCo Community Breakfast (separate tickets required) is at 8 a.m., then the exhibit hall opens promptly at 10 a.m. and runs until 6 p.m. On Sunday, the exhibit hall opens at 11 a.m. and closes at 4 p.m.

**Tickets for RAINBOWfest** may be obtained directly from THE RAINBOW. We'll also send you a reservation form so you can get a special room rate.

**The POSH way to go.** You can have your travel arrangements and hotel reservations handled through RAINBOW affiliate, POSH Travel Assistance, Inc., of Louisville. For the same POSH treatment many of our exhibitors enjoy, call POSH at (502) 893-3311. All POSH services are available at no charge to RAINBOWfest attendees.

**BE THERE!**

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## COCO COMMUNITY BREAKFAST

### Dan Bruns — President, General Videotex Corporation

Our keynote speaker for the traditional CoCo Community Breakfast is Dan Bruns, president and chief executive officer of General Videotex Corporation (Delphi). Formerly a systems analyst for Sperry Univac, Mr. Bruns has helped Delphi grow into a major telecomputing information service and an important meeting place for the CoCo Community.

## SPECIAL EVENT!

We're pleased to present The Educational Sandbox, a joint Tandy/RAINBOW effort. This is a computer workshop for RAINBOWfest kids. There will be two sessions on both Saturday and Sunday. One workshop will be for the kindergarten through third-grade set, and the other for fourth- through seventh-graders. Each workshop will last between 45 minutes and one hour, and will give the children and their parents hands-on experience in using Tandy computers and software.

**RAINBOWfest** - Chicago, Illinois
**Dates:** May 20-22, 1988
**Hotel:** Hyatt Regency Woodfield
**Rooms:** $64 per night, single or double
**Advance Ticket Deadline:** May 6, 1988

*Join us at a future RAINBOWfest!*

**RAINBOWfest** - Princeton, New Jersey
**Dates:** October 21-23, 1988
**Hotel:** Hyatt Regency Princeton
**Rooms:** $88 per night, single or double
**Advance Ticket Deadline:** Oct. 7, 1988

FREE T-Shirt to first five ticket orders received from each state.

First 500 ticket orders received get *The Rainbow Book of Simulations*.

**YES,** I'm coming to **Chicago!** I want to save by buying tickets now at the special advance sale price. Breakfast tickets require advance reservations.

Please send me:

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____ One-day tickets at $7 each total ____
Circle one: Friday Saturday Sunday
____ Saturday CoCo Breakfast at $12 each total ____
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*(Advance sale-priced T-shirts must be picked up at the door)*
Handling Charge $1 ____
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☐ Also send me a hotel reservation card for the Hyatt Regency Woodfield ($64, single or double room).

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(please print)
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☐ Payment Enclosed, or Charge to:
☐ VISA ☐ MasterCard ☐ American Express

Account Number ____
Exp. Date ____
Signature ____

Advance ticket deadline: May 6, 1988. Orders received less than two weeks prior to show opening will be held for you at the door. Tickets will also be available at the door at a slightly higher price. Tickets will be mailed six weeks prior to show. Children 4 and under, free; over 4, full price.

Make checks payable to: The RAINBOW. Mail to: RAINBOWfest, The Falsoft Building, 9509 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059. To make reservations by phone, in Kentucky call (502) 228-4492, or outside Kentucky call (800) 847-0309.

```
170 IFR>(K+L+2) THENR=0:SOUND150
,5:GOTO140 ELSE180
180 R=R-1:Z=R-L:M=44:GOTO210
200 IFC=0 THEN90ELSE210
210 C=C+1:IFC=>M THEN1360
220 POKE282,0:CLS3:PRINT@128,STR
ING$(32,182);:PRINT@160,TAB(4);C
HR$(188)"5";:PRINTTAB(9);CHR$(18
8)"10";:PRINTTAB(14);CHR$(188)"1
5";:PRINTTAB(19);CHR$(188)"20";
230 PRINTTAB(24);CHR$(188)"25";T
AB(29);CHR$(188)"30";:PRINT@0,"t
ab"BK$"guide"BK$"and"BK$"end"BK$
"of"BK$"text"BK$"marker";
240 EN=96-Z:PRINT@192,"";:PRINTT
AB(Z);STRING$(EN,191);:PRINTSTRI
NG$(32,183);
250 PRINT@357," MARGINS ARE"L+1"
AND"R+1;:PRINT@417," LINE LENGTH
 IS"R+1-L"CHARACTERS ";
260 PRINT@480,STRING$(4,128);:PR
INT@484,"enter"BK$"a"BK$"period"
BK$"."BK$"to"BK$"end";:PRINTSTRI
NG$(4,128);:POKE1535,128:POKE152
3,46
270 PRINT@71," LINE NUMBER "C" "
;:PRINT@192,;:LINEINPUTL$(C)
280 IFL$(C)="."THEN C=C-1:GOTO90
290 IF LEN(L$(C))>Z THEN300ELSE3
10
300 L$(C)="":PRINT@320," TOO LON
G- TRY AGAIN ":SOUND100,10:SOUND
50,10:FORD=1TO1000:NEXT:GOTO220
310 IFLEN(L$(C))=0 THENL$(C)=" "
320 GOTO210
400 IFC=0 THEN90ELSEPOKE282,0
410 CLS3:PRINT@33,"** edit"BK$"r
outine **";:PRINT@96,;
420 Q=0:P=0
430 Q=Q+1:P=P+1
440 PRINTQ;TAB(4);L$(Q)
450 IFQ=C THEN480 ELSE460
460 IFP=5 THEN480
470 GOTO430
480 P=0
490 YY=0:PRINT"enter"BK$"line"BK
$"number"BK$"or"BK$"enter";:INPU
TYY
500 IF YY>C THEN490 ELSE510
510 IFYY<=0 THEN520 ELSE540
520 IFQ=C ANDP=0 THEN90ELSE530
530 CLS3:GOTO470
540 EE=0:EE=YY:YY=0:CLS3
550 PRINT@97," OLD LINE: ";:PRIN
TL$(EE):L$(EF)=L$(EE):L$(EE)=""
560 PRINT@257,;:POKE282,0:PRINT
" NEW LINE: ";:PRINTSTRING$(Z,".
");:PRINT@268,;:LINEINPUTL$(EE)
570 IFL$(EE)="" THENL$(EE)=L$(LF
):GOTO410
580 IFL$(EE)="."THEN L$(EE)="":E
E=EE-1:C=C-1
590 IF LEN(L$(EE))>Z THENPRINT"
TOO LONG - TRY AGAIN":L$(EE)="":
GOTO560
600 GOTO410
690 PRINT@480,BK$"touch"BK$"any"
BK$"other"BK$"key"BK$"to"BK$"ret
urn"BK$;:POKE1535,128:RETURN
700 POKE282,255:CLOSE
710 CLS4:PRINTSTRING$(64,182);:P
RINT@97," DID YOU SAVE YOUR LAST
 PAGE? ";:PRINT@160,STRING$(64,1
82);:PRINT@257," TERMINATE ?...(
y"BK$"to"BK$"confirm)"BK$;
720 POKE1296,40:POKE1309,41:GOSU
B690
730 Q$=INKEY$:IFQ$=""THEN730
740 IFQ$="Y" ORQ$="y"THEN790
750 IFQ$<>"Y" ORQ$<>"y"THEN90
790 CLS3:PRINT"THE LETTER WRITER
 PROGRAM IS","TERMINATED   (C)19
84 ASHALLOCK","TYPE "CHR$(34)"CO
NT"CHR$(34)" TO CONTINUE WITHOUT
 LOSS OF DATA ";:END
800 IFC=0 THEN2440ELSE810
810 CLS4:PRINT@39,"** save"BK$"r
outine **";:GOSUB2700:FORD=1TO10
00:NEXT
820 IF DV=-1 THENPRINT@98," * *
* ready"BK$"cassette * * * ";ELS
EPRINT@98," * * * touch"BK$"S"BK
$"to"BK$"save * * *";:GOTO920
830 PRINT@227," [space] TURNS MO
TOR OFF ";
840 PRINT@291," [enter] TURNS MO
TOR ON ";
850 PRINT@358," TOUCH [s] TO SAV
E ";:GOSUB690
860 I$=INKEY$:IFI$=""THEN860
870 IFI$=" "THEN910
880 IFI$=CHR$(13)THEN900
890 IFI$="S" ORI$="s"THEN920 ELS
E90
900 PRINT@424," MOTOR IS on  ";:
AUDIOON:MOTORON:GOTO860
910 PRINT@424," MOTOR IS off ";:
AUDIOOFF:MOTOROFF:GOTO860
920 CLS3:PRINT@97," NAME MUST BE
 BETWEEN 1 AND 8 ";:PRINT@129,"
CHARACTERS LONG only ";
930 NE$="":PRINT@225," ENTER NAM
E YOU WISH TO SAVE ";:PRINT@257,
;:LINEINPUT" THIS FILE AS: ";NE$
940 IF LEN(NE$)=0 THEN2440
950 IF LEN(NE$)>8 THEN810ELSE960
960 PRINT@321," SAVING TO "TD$"
AS ";NE$" ";STRING$(5,175);
970 IF DV=-1 THENMOTORON:FORD=1T
O300:NEXT:MOTOROFF
```

```
980 OPEN"O",#DV,NE$
990 PRINT#DV,C,L,R,Z,M
1000 FOR RR=1 TOC
1010 PRINT#DV,L$(RR)
1020 NEXT
1030 CLOSE
1040 PRINT@321," FILE IS SAVED A
S "NE$" ";STRING$(5,175);
1050 IF DV=-1 THENMOTORON:FORD=1
TO100:NEXT:MOTOROFF
1060 GOTO2440
1070 GOTO2440
1100 IF C>0 THEN30ELSE1110
1110 CLS3:PRINT@38,"**  load"BK$
"routine  **";:GOSUB2700:FORD=1T
O1000:NEXT
1120 IF DV=-1 THENPRINT@98," * *
 * ready"BK$"cassette * * * ";EL
SEIF DV=1THEN1220
1130 PRINT@227," [space] TURNS M
OTOR OFF ";
1140 PRINT@291," [enter] TURNS M
OTOR ON ";
1150 PRINT@358," TOUCH [l] TO LO
AD ";:GOSUB690
1160 I$=INKEY$:IFI$=""THEN1160
1170 IFI$=" "THEN 1210
1180 IFI$=CHR$(13)THEN1200
1190 IFI$="L" ORI$="l"THEN1220 E
LSE90
1200 PRINT@424," MOTOR IS on  ":
:AUDIOON:MOTORON:GOTO1160
1210 PRINT@424," MOTOR IS off ";
:AUDIOOFF:MOTOROFF:GOTO1160
1220 CLS3:GOSUB2700:PRINT@1," SY
STEM SET TO "TD$" ";
1230 '* SAVE ROUTINE
1240 NE$="":PRINT@225,;:INPUT" E
NTER NAME OF FILE ";NE$
1250 IF LEN(NE$)=0 THEN90 ELSEIF
NE$="DIR" THEN2600 ELSE1260
1260 IF LEN(NE$)>8 THEN1240 ELSE
1270
1270 OPEN"I",#DV,NE$
1280 INPUT#DV,C,L,R,Z,M
1290 PRINT:PRINT" LEFT MARGIN SE
T AT ";L+1
1300 PRINT:PRINT" RIGHT MARGIN S
ET AT ";R+1
1310 PRINT:PRINT" PAGE LENGTH SE
T AT ";M
1320 FOR RR=1TO C
1330 IF EOF(DV) THEN90
1340 LINEINPUT#DV,L$(RR)
1350 NEXT:CLOSE:GOTO2440
1360 CLS3:PRINT@33," YOU HAVE RE
ACHED THE LIMIT ";:PRINT@65," OF
 YOUR PAGE LENGTH ";
1370 PRINT@129," DO YOU WANT TO
INCREASE THE ";:PRINT@161," LENG
TH ( y OR ANY OTHER KEY)";
1380 Y$=INKEY$:IFY$=""THEN1380EL
SE1390
1390 IFY$="Y"OR Y$="y"THEN1400EL
SE1430
1400 PRINT@225,;:MM=0:INPUT" ENT
ER NEW PAGE LENGTH ";MM
1410 IFMM <M THEN1400 ELSE1420
1420 M=MM:GOSUB690
1430 IFINKEY$=""THEN1430 ELSE90
1490 '* PRINT FANFOLD ENVELOPE
 ALL PRINTER CODES FOR DMP110
1500 CLS4:PRINT@130," READY PRIN
TER PAPER ";:GOSUB1620:PRINT@480
," ANY KEY WHEN READY ";:EXEC&HA
171:PRINT#-2,STRING$(18,10):PRIN
T#-2,CHR$(27);CHR$(17);
1510 PRINT#-2,"Arthur S. Hallock
":PRINT#-2,"Route 1, Box 198HHH"
:PRINT#-2,"Deming, NM  88030"
1520 PRINT#-2,STRING$(12,10)
1530 CLS4:PRINT@130," ENTER ADDR
ESSEE: ":PRINT@224," NAME: ";:PR
INT@256," ADDR: ";:PRINT@288," C
TST: ";:PRINT@320," ZIP : ";:PRI
NT@224,;
1540 POKE282,0:LINEINPUT" NAME:
";A$
1550 LINEINPUT" ADDR: ";B$
```

**"I cannot imagine the CoCo 3 without ADOS-3; it would not be a complete machine."**
**The RAINBOW, July 1987**

You've moved up to a CoCo 3. A powerful new machine. Now, it's time to give BASIC a shot in the arm, with ADOS-3. Wouldn't it be nice to turn on your machine and be greeted by an 80-column display, in the colors of your choice, with your own custom startup message? To run routinely at 2 MHz (double speed) without having to slow down for disk and printer operations? This and much, much more is possible with ADOS-3, our CoCo 3 adaptation of the acclaimed original ADOS, which shares the original's virtual 100% compatibility with commercial software. After customizing ADOS-3 using the provided configuring utility, you can have it burned into an EPROM that plugs into the Disk BASIC ROM socket, or just use it in RAM as a disk utility. (EPROM + burning will cost $15-20; we provide information concerning how you can have this done.) Supports double-sided drives (35, 40, or 80 tracks). FAST and SLOW commands, auto line number prompts, RUNM command, keystroke macros, arrow-key scroll through BASIC programs, auto-edit of error line, and many more valuable features.

**"ON A SCALE OF 1 TO 10, I RATE ADOS-3 A SOLID 15." RAINBOW, 7/87**
Disk . . . $34.95 Original ADOS for CoCo 1 or 2 . . . $27.95 (See 6/87 RAINBOW review)
Original ADOS plus ADOS-3 . . . . . . . . . . . . . . . . . . . . . . . . .$50.00

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| | |
|---|---|
| 30 Meg Burke&Burke System Complete | $580.00 |
| 20 Meg High Speed System Complete | $799.00 |
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## CoCo Hard Drive Interfaces

| | | |
|---|---|---|
| FHL HCA/WD High Speed Interface | | 119.00 |
| (Uses WD 1002-05 above, includes software OS9 only) | | |
| **Burke & Burke XT** PC style interface | | 69.95 |
| **B&B XT RTC** w/battery clock/calendar | | 99.95 |
| **(See software listed under B&B to right)** | | |

## Hard Drive Controllers

| | | |
|---|---|---|
| WD PC RLL for Burke & Burke Interface | | 92.00 |
| Western Digital WD 1002-05 | $289.00 | 210.00 |
| (For FHL High Speed Hard Disk Interface) | | |
| Adaptec 4000 SCSI/SASI | --- | 162.00 |
| Adaptec 4070 SCSI/SASI RLL | --- | 162.00 |
| (For Owl and Disto interfaces) | | |

## HARD DRIVES (5.25" HALF HEIGHT)

**MiniScribe High Quality Drives - 1 Year Warr.**

| | | | |
|---|---|---|---|
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| | | |
|---|---|---|
| ST506 Hard disk to controller, set 2 | --- | 28.00 |
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| B&B 4' Cable Set | --- | 35.00 |

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| | | |
|---|---|---|
| **B&B Hyper I/O run DECB on B&B hard drive** | | 29.95 |
| **B&B Hyper III** Ramdisk/spooler for above | | 19.95 |
| **eForth** closeout continues (Hurry) | $79.95 | 30.00 |

## CoCo OS9 Level II w/512K *

| | | |
|---|---|---|
| The **Wiz** Communications software for CoCo 3 | $79.95 | 69.95 |
| **Sculptor (BIG SALE!!!)** | $450.00 | **149.00** |
| Database - 4th generation language | | |
| **DynaStar** Word Processor | $150.00 | 100.00 |
| **DynaSpell** spelling checker by Dale Puckett | $94.50 | 45.00 |
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| | | |
|---|---|---|
| **Inside OS9 Level II** | $39.95 | 29.95 |
| **Starting Forth** (Limited) | $18.95 | 15.00 |

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| | | |
|---|---|---|
| **Citizen** | | |
| 120D 10" carriage 120CPS Draft | $229.00 | 193.00 |
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| ND10 10" carriage 180CPS Draft | $499.00 | 332.00 |
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| P1080i 144CPS Draft | $269.00 | 198.00 |
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## MODEMS

| | | |
|---|---|---|
| **Packard Bell** | | |
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**ORDERING INFORMATION** VISA, M/C and AMEX. NY residents add 7% sales tax. US shipping add $3.50. Please call for Air Express shipping. Send for **FREE** FHL NewsLetter and catalog.

*** Most of our software requires OS9 LII and 512K.**

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Telex 646740 - FAX 315/474-8225
**Call 315/474-7856**

# HARD DISK SYSTEMS INFORMATION

For the best and fastest hard disk systems, trust Frank Hogg Laboratory.

At Frank Hogg Laboratory, we have taken over 3 years of our knowledge and expertise in the manufacture of the well known ***QT*** 68000 based computers and applied it to the CoCo. Many of the components used in our hard disk systems are the same as that used in the ***QT***!

Hard disk systems have been available for the CoCo for some years now, most are good reliable systems. However we have two new systems for the CoCo that are better. They are just as reliable as other systems, perhaps even more so. But they are both faster and less expensive.

Our top of the line system features Bruce Isted's interface for the Western Digital WD 1002-05 high speed controller. **Features**; fastest system available, 1 megabyte transfer in 37 seconds!!, twice as fast as other systems!, supports 4 floppy and 3 hard drives, type ahead for both floppy and hard disk, auto boot OS9 L1 or L2 from hard or floppy disk. **Disadvantage**; does not support DECB. This is *the* system of choice for the serious OS9 user. 20 Meg systems are **$799** and 40 Meg systems are **$899**. Other sizes are available.

Our second system features the Burke & Burke XT and XT RTC interface. This interface uses popular and inexpensive IBM PC type controllers. For this reason it is the least expensive hard disk system available today. Not as fast as the Isted system but faster than any other system available. It also supports RLL drives so we are able to offer a 30 Megabyte system for only **$580 COMPLETE!** See the price list for other options. **Disadvantage**; requires a multi-pak. **Note:** DECB support and other software options are listed on our price list.

# ANNOUNCEMENT!

## FRANK HOGG LABORATORY BUYS OUT INVENTORY OF ***Sculptor!*** SELLS FOR LESS THAN DISTRIBUTOR COST!!!

Frank Hogg Laboratory purchased the remaining inventory of another *Sculptor* distributor! Because we got them so low we can offer them to you at **tremendous** savings.

***Sculptor*** for the CoCo III with OS9 Level II* is

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**See Dale Puckett's February and March 1988 Rainbow columns for more information on this great package.**

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*** Most of our software requires OS9 LII and 512K.**

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Telex 646740 - FAX 315/474-8225
**Call 315/474-7856**

```
1560 LINEINPUT" CTST: ";C$
1570 LINEINPUT" ZIP : ";D$:POKE2
82,255
1580 PRINT#-2,TAB(45)A$:PRINT#-2
,TAB(45)B$:PRINT#-2,TAB(45)C$
1590 PRINT#-2,CHR$(27);CHR$(14);
:PRINT#-2,TAB(48)D$:PRINT#-2,CHR
$(27);CHR$(15);
1600 PRINT#-2,CHR$(27);CHR$(19);
:PRINT#-2,CHR$(12):GOTO90
1610 '* PRINTER TEST ROUTINE
1620 IF(PEEK(&HFF22)AND1)THEN163
0ELSERETURN
1630 SOUND200,3:PRINT@483,"*** P
RINTER NOT READY *** ";:FORD=1TO
1000:NEXT:GOTO90
1700 IFC=0 THEN90ELSE1720
1710 '* CHECK PRINTER OPTIONS
1720 CLS3:PRINT@33,"**  hardcopy
"BK$"routine  **";
1730 IF(PEEK(&HFF22)AND1)THENSOU
ND150,5:PRINT@129," printer IS n
ot TURNED on ";:PRINT@225," PLEA
SE CHECK, THEN TOUCH ";:PRINT@25
7,;:PRINT" [SPACE] ENTER FOR MEN
U   ";:PRINT@289,;:LINEINPUT" EN
TER TO CONTINUE  ";K$:IFK$=" "TH
EN90ELSE1720
1740 PRINT@97," DO YOU NEED A FO
RM FEED ? ";:PRINT@129,"  (y OR
TOUCH ANY KEY ) ";
1750 Y$=INKEY$:IFY$=""THEN1750
1760 IFY$="Y"OR Y$="y"THEN 1770E
LSE1780
1770 PRINT#-2,CHR$(12)
1780 GOSUB1900:CLS3
1790 CP=0:PRINT@352,STRING$(2,12
8)"enter"CHR$(128)"zero"CHR$(128
)"to"CHR$(128)"return"CHR$(128)"
to"CHR$(128)"menu"STRING$(2,128)
;:PRINT@417,"";
1800 INPUT" NUMBER OF COPIES NEE
DED ";CP:IFCP=0 THEN90
1810 FORZZ=1TO CP
1820 FORE=1TO C
1830 PRINT#-2,TAB(L);L$(E)
1840 IF E=44 ORE=95 THENPRINT#-2
,CHR$(12):ELSE1860
1850 IFST$="Y"THENPRINT@481," TO
UCH [ENTER] TO CONTINUE ";ELSE18
60
1860 NEXT
1870 E=0:NEXT
1880 E=0:PRINT#-2,CHR$(12);:GOTO
90
1900 CLS3:PRINT@33,"** LETTERHEA
D AND  ";:PRINT@67," SALUTATION
ROUTINE **";
1910 PRINT@129," SELECT LETTERHE
AD ";
1920 PRINT@195,"[a]RTHUR S. HALL
OCK ";
1922 PRINT@227,"[t]EXT ONLY
   ";
1930 I$=INKEY$:IFI$=""THEN 1930
1940 IFI$="A" ORI$="a" THEN1960
1942 IFI$="T" ORI$="t" THEN2180
1950 IFI$="" THENRETURNELSE1940
1960 CLS3:PRINT@33," LETTERHEAD
FOR ... ASHALLOCK ";
1970 POKE282,0
1980 PRINT@97," ";:LINEINPUT"DAT
E ";D$
1990 PRINT@225," SALUTATION OR H
EADING ";:PRINT@289,"";:LINEINPU
TSA$
2000 POKE282,255
2010 LH$="Arthur S. Hallock"
2020 AD$="Route 1, Box 198HHH
 Deming, New Mexico  88030"
2030 GOTO2040
2040 PRINT#-2:PRINT#-2
2050 PRINT#-2,CHR$(27);CHR$(66);
CHR$(27);CHR$(14);
2060 PRINT#-2,TAB(8);LH$
2070 PRINT#-2,CHR$(27);CHR$(15);
2080 PRINT#-2,CHR$(27);CHR$(29);
2090 PRINT#-2,TAB(44);D$
2100 PRINT#-2,CHR$(27);CHR$(66)
2110 PRINT#-2,TAB(12)AD$
2120 PRINT#-2,CHR$(27);CHR$(29);
2130 PRINT#-2,STRING$(95,167)
2140 PRINT#-2:PRINT#-2
2150 PRINT#-2,CHR$(27);CHR$(29)
2160 PRINT#-2,TAB(L+1);SA$:PRINT
#-2
2170 RETURN
2180 CLS:PRINT@33,"** TEXT ENTRY
 ROUTINE **"
2190 POKE282,0
2200 PRINT@128," ";:INPUT"DATE "
;D$
2210 PRINT@192," ";:INPUT"PAGE N
UMBER ";P$
2220 PRINT@256," ";:LINEINPUT"HE
ADER (96 CHARACTERS, MAXIMUM)";H
E$
2230 PRINT:PRINT" ";:INPUT"NUMBE
R OF LINES OF SPACE FROM  THE P
OP OF PAGE ";N
2240 PRINT:PRINT" ";:LINEINPUT"T
ITLE OF ARTICLE OR PAGE      ";
TT$
2250 TT=LEN(TT$):TU=96-TT:TA=TU/
6
2260 POKE282,255
2270 PRINT#-2,STRING$(N,10)
2280 PRINT#-2,CHR$(27);CHR$(20);
2290 PRINT#-2,D$;TAB(80)"Page "P
$
2300 PRINT#-2,CHR$(27);CHR$(29)
2310 PRINT#-2,HE$
2320 PRINT#-2,STRING$(96,167)
2330 PRINT#-2:PRINT#-2
```

```
2340 PRINT#-2,CHR$(27);CHR$(14);
2350 PRINT#-2,TAB(TA);TT$
2360 PRINT#-2,CHR$(27);CHR$(29);
CHR$(27);CHR$(15);CHR$(27);CHR$(
17);
2370 RETURN
2440 K=95:POKE282,255:BK$=CHR$(1
28):CLS3
2450 PRINTBK$"letter"BK$"writer"
BK$"program"BK$"in"BK$"basic"BK$
;
2460 PRINT@71,"** "BK$"main"BK$"
menu"BK$" **";
2470 PRINT@129,"c";:PRINT@132,"
COMMENCE  A  NEW  LETTER ";
2480 PRINT@161,"a";:PRINT@164,"
ADD  TO  EXISTING LETTER ";
2490 PRINT@193,"e";:PRINT@196,"
EDIT, INQUIRE, VIEW PAGE ";
2500 PRINT@225,"l";:PRINT@228,"
LOAD PAGE - TAPE OR DISK ";
2510 PRINT@257,"h";:PRINT@260,"
HARDCOPY ON LINE PRINTER ";
2520 PRINT@289,"s";:PRINT@292,"
SAVE PAGE - TAPE OR DISK ";
2530 PRINT@321,"x";:PRINT@324,"
EXIT - TERMINATE PROGRAM ";
2540 PRINT@353,"p";:PRINT@356,"
PRINT : FANFOLD ENVELOPE ";
2550 PRINT@416,"  NOTE: "BK$"sav
e"BK$"page"BK$"if"BK$"you"BK$"ha
ve"BK$BK$BK$BK$"made"BK$"any"BK$
"changes"BK$"since"BK$"entry"BK$
BK$;
2560 PRINT@486," touch MENU choi
ce ";
2570 M$=INKEY$:IFM$=""THEN2570
2580 ON INSTR("PWACNELHSQXTpwacn
elhsqxt",M$)GOTO1500,100,200,100
,100,400,1100,1700,800,700,700,7
00,1500,100,200,100,100,400,1100
,1700,800,700,700,700
2590 GOTO2570
2600 DIR
2610 IFINKEY$=""THEN2610 ELSE122
0
2700 TD$="":IFPEEK(188)=14 THENT
D$="DISK" ELSETD$="TAPE"
2710 IF TD$="TAPE" THENDV=-1 ELS
E IFTD$="DISK" THENDV=1
2720 RETURN
9999 SV$="LETRWRTR":FORC=1TO3:CL
S3:PRINT@96," SAVING "SV$" TO TA
PE:"C;:CSAVESV$:MOTORON:FORD=1TO
3000:NEXT:NEXT:FORD=1TO5000:NEXT
:MOTOROFF:CLS3:PRINT@96," "SV$"
IS SAVED"C-1"TIMES";:PRINT@416,;
:END
```

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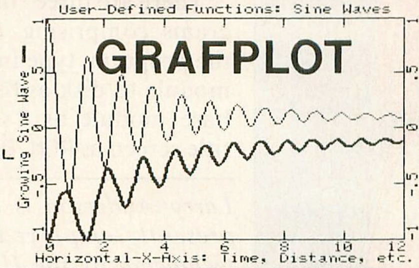

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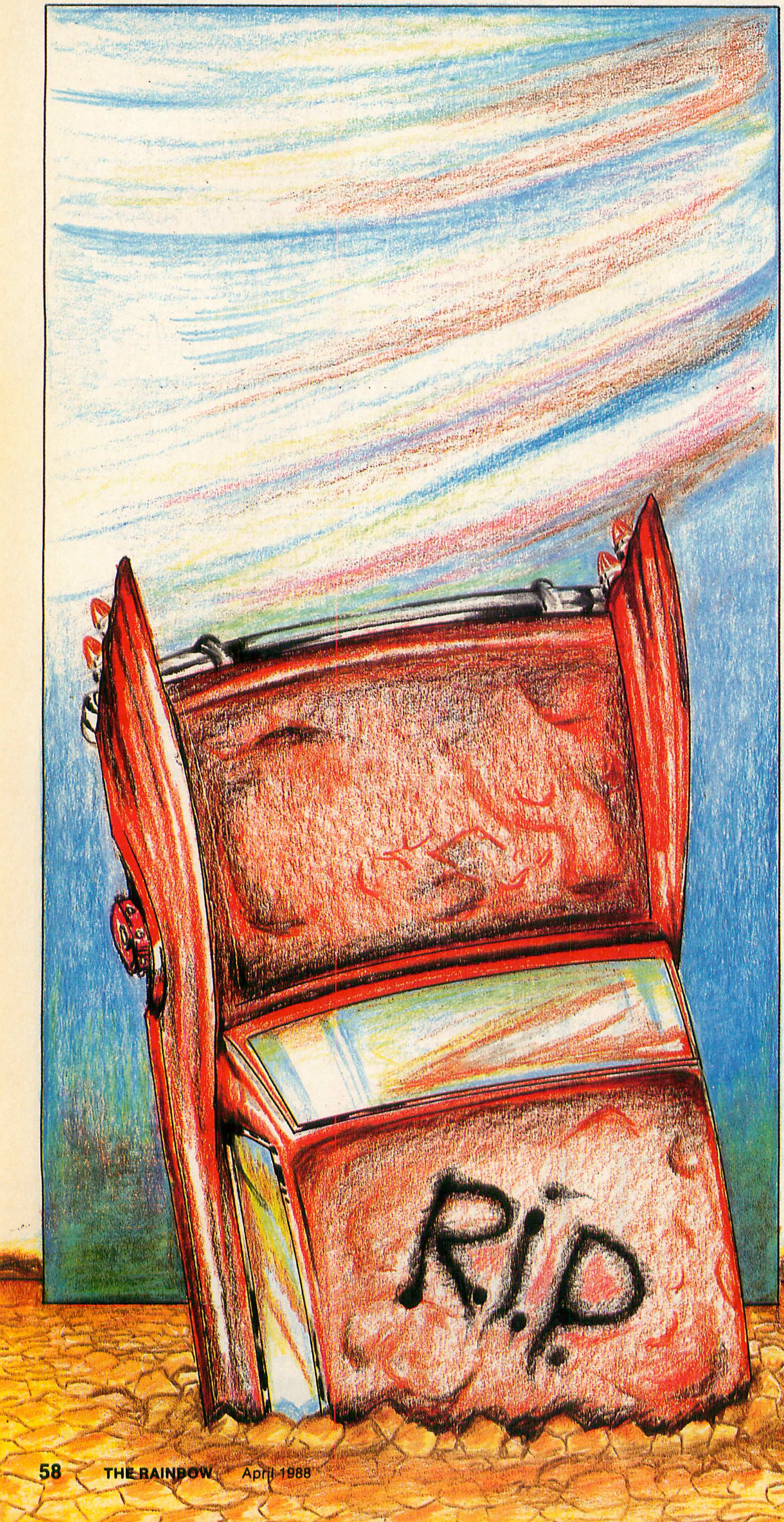


*Keep maintenance schedules for up*

# CoCo's Auto

I wrote it down on a piece of paper somewhere. It was about 5,000 miles ago . . . or was it 7,000? Maybe it was my wife's car, instead. My note is lost, and who remembers when they get oil changes anyway?

Folks agree that regular maintenance will save them money down the road, but they hate the bother. *Remember* is a program to help you with the tiresome details. Just enter your car's maintenance schedule (by the owner's manual or by your own preferences) and the work that has already been done, and you have finished the hardest part.

Later on, you enter current mileage and date to receive a report of what's needed. You can also record receipts such as gasoline and oil, and get a summary (cost per thousand miles) of operating expenses. You can keep track of up to five vehicles as the program is written. And, if you want, you can change the checklist items to suit your own requirements.

**Running the Program**

There are three "modules" or subprograms comprising *Remember.* To use the program, type in and save the main module to disk as `MAIN.BAS`, the database module as `EXPNS.BAS`, and the title screen as `REM.BAS`. Load `MAIN` and

---

*Larry Anderson is an auto mechanic presently employed as an electronic technician by the U.S. Postal Service. He holds a bachelor's degree in English with minors in math and physics, and enjoys programming on the CoCo 3 and the 1000 SX. His wife, Linda, uses the 1000 SX in her job as a church secretary. Their daughter, Kacy, enjoys Adventures and programming.*

*to five vehicles*

# Maintenance Manager

### By Larry Anderson

enter `RUN 1400` to set up two blank files (vehicle names will go in these), then `RUN ″REM″`. Line 45 sets the baud rate for your printer to 9600 — you can edit it to whatever rate you choose. Your selection from the main menu sets the value of `A`, which automatically sets up the proper sequence through the program and back to the main menu.

Selection V will set up new vehicle files, not allowing duplicate names or names of more than eight characters. The variable `N$` names the currently accessed vehicle, while `M(Q)` and `H$(Q)` contain data about service requirements and the latest services done. This is where you enter the maintenance schedule of your choice, which can be different for each vehicle. Data is finalized by a press of the ENTER key, which allows for corrections by backspacing. Note that dates must be entered without slashes or dashes (/ or -). So, July 18, 1986, would be entered as `071886`. You do have the chance to start a screen over by pressing ENTER several times until the "Entries Correct Y/N?" prompt appears, and then pressing N.

Select C and you will be prompted for a car's name, its current mileage and today's date. Notice that the last name used (which should be in the upper-right corner of the screen) may be entered without retyping, just press ENTER. *Remember* computes whether or not service is due. `M(0)` is the current mileage and `H$(0)` is the current date. Service is "due" if within 500 miles below to 1,000 miles above the desired interval, and "overdue" when above that figure. Submenu selection P gets you a printed copy with maintenance guides, and Selection E calculates a summary from the expenses you have kept for that car. The total sum of your expenses is `SUM`, which is multiplied by 100 and divided by the mileage interval (in thousands) you select; the resulting number is converted to an integer and finally divided by 100. This assures a value in dollars and cents, not several decimal places. To return to the main menu at any time, just enter a `@`.

Selection U brings you to another submenu to update service or expense records. The service update screen shows your previous services completed and allows you to change or update any one or all items. Pressing the ENTER key steps you past any entries you don't want to change. Step through all entries until the message "Entries Correct Y/N?" appears. Pressing N at this point allows re-entry of this screen, but the old data displayed will not be shown. To redisplay old data, enter `@` and again select U. Within the record-keeping section, submenus allow you to review or change your expense records or return to the main menu.

Selection I shows you the names of cars you already have files for, and Q quits the program.

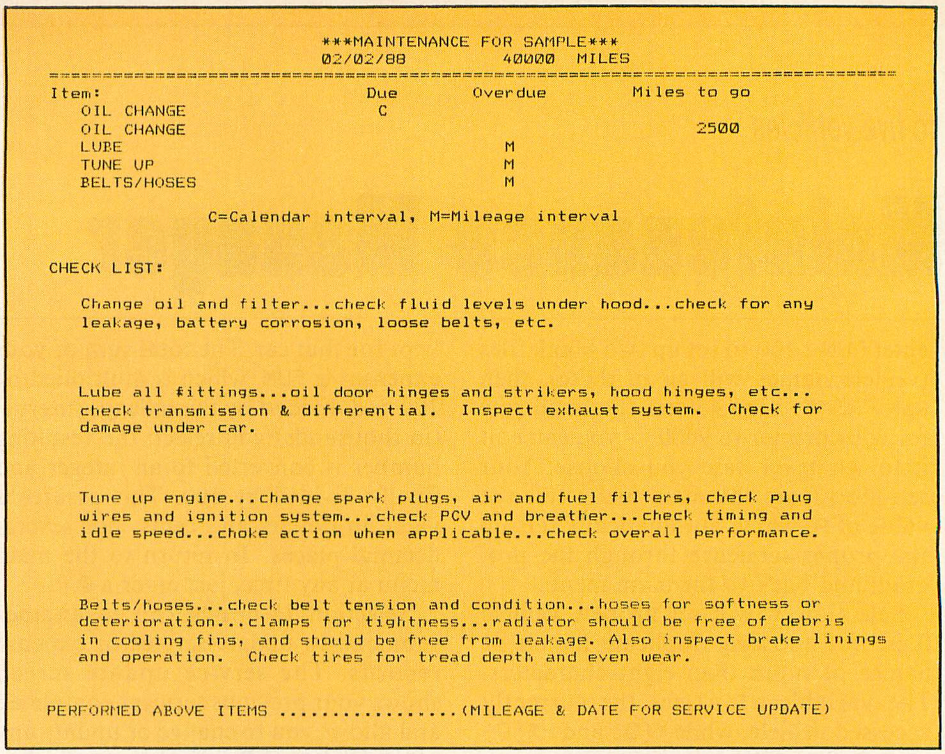
*Remember* accesses several files on your disk drive: `VEH.NDX`, which stores the names you assign to your vehicles; `CRNT.NDX`, which contains the name of the vehicle you last accessed; `EXPNS.BAS`, the database and the `.DAT` and `.DTL` files for each vehicle, which contain schedules of maintenance and expense records. There is, of course, the main program section, `MAIN.BAS`; and the title screen is handled by `REM.BAS`.

A large part of this program consists of error traps and screen formatting. For instance, Line 550 ensures that current mileage isn't less than that of the last service performed. Lines 575 through 620 make sure that your current date includes not more than 12 months in the year, nor more than 31 days in a month; nor can the dates be zero. Also, the current date can't be earlier than the last service date! Tests for valid names are used to avoid "near misses" in spelling, which could cause an NE Error or other errors to crash the program. You can always consult the Index to see what names you have already "remembered."

The `EXPNS` module is a small database geared to work with the `MAIN` module. Three fields titled `DATE`, `AMOUNT` and `DETAILS` are filed in the `.DTL` file with that vehicle's name preceding it, and probably will contain only a few characters each. Records may be added, removed, or merely reviewed. Thanks go to Keith Baker for some good ideas from his cassette-based *File-it* database, *The Color Computer Magazine*, January 1984, Page 117.

No search or sort capabilities were included in `EXPNS`, and data is automatically posted to the `.DTL` disk files. The blank `.DTL` file was set up by `MAIN` so that you would not crash at this point by attempting to read a file not yet created. Though it has no contents at first, the CoCo will recognize its existence, and later you can add records to it.

You can change the items of suggested maintenance to suit your own preferences. The ones included are the items I rate most important. Take care of your car, let *Remember* do the detail work that nobody likes, and enjoy a real advantage in reliability and savings!



```
                    ***MAINTENANCE FOR SAMPLE***
                    02/02/88           40000  MILES
==============================================================================
Item:                                Due       Overdue          Miles to go
   OIL CHANGE                         C
   OIL CHANGE                                                     2500
   LUBE                                          M
   TUNE UP                                       M
   BELTS/HOSES                                   M

            C=Calendar interval, M=Mileage interval


CHECK LIST:

   Change oil and filter...check fluid levels under hood...check for any
   leakage, battery corrosion, loose belts, etc.



   Lube all fittings...oil door hinges and strikers, hood hinges, etc...
   check transmission & differential.  Inspect exhaust system.  Check for
   damage under car.



   Tune up engine...change spark plugs, air and fuel filters, check plug
   wires and ignition system...check PCV and breather...check timing and
   idle speed...choke action when applicable...check overall performance.



   Belts/hoses...check belt tension and condition...hoses for softness or
   deterioration...clamps for tightness...radiator should be free of debris
   in cooling fins, and should be free from leakage. Also inspect brake linings
   and operation.  Check tires for tread depth and even wear.


PERFORMED ABOVE ITEMS ................(MILEAGE & DATE FOR SERVICE UPDATE)
```

Happy motoring (and computing)!

*(Questions or comments about this program may be directed to the author at 202 Jackson St., Benton, LA 71066. Please enclose an SASE when writing for a response.)* ☐

| | | | |
|---|---|---|---|
| 85 | 235 | 810 | 86 |
| 140 | 108 | 915 | 25 |
| 230 | 210 | 1000 | 67 |
| 270 | 9 | 1075 | 151 |
| 350 | 202 | 1135 | 39 |
| 425 | 237 | 1160 | 242 |
| 515 | 59 | 1220 | 189 |
| 590 | 119 | 1280 | 250 |
| 665 | 87 | 1375 | 235 |
| 735 | 101 | END | 106 |

**Listing 1:** `MAIN`

```
5 ' *******REMEMBER********
  *********V1.01*********
10 '*****COPYRIGHT 1985****
  ***********************
15 '***********************
  ***BY LARRY ANDERSON***
20 '***********************
  ***BOX 180 BENTON LA***
25 '***********************
  ***********************
30 '
35 '
40 CLS3:CLEAR5000
45 POKE150,1'***** 9600BAUD POKE
50 GOTO1350'*****  PCLEAR ROUTIN
E
55 DIMA$(150),B$(150),C$(150)
60 U$="r e m e m b e r":U1$=STRI
NG$(8,128)+"MAIN MENU":U2$=STRIN
G$(6,128)+"NEW VEHICLE":Z$=CHR$(
128)
65 W$=STRING$(8,128)+"@escapes"+
Z$+"to"+Z$+"menu"+STRING$(7,128)
70 CLS3:PRINTU$;:GOTO855
75 CLS3:PRINT@ 0,U$;:PRINT@15,U1
$;:PRINT@105,"Vehicle"+Z$+"entry
";STRING$(3,128);:PRINT@169,"Che
ck"+Z$+"if"+Z$+"service";:PRINT@
201," is"+Z$+"due";
80 PRINT@208,STRING$(9,128);
85 PRINT@265,"Update"+Z$+"vehicl
e";STRING$(2,128);:PRINT@297," h
istory";STRING$(8,128);:PRINT@36
1,"Index";STRING$(11,128);
90 PRINT@425,"Quit";STRING$(12,1
28);
95 GOSUB1440
100 B$="VCUIQ":A=INSTR(B$,A$)
105 ON A GOTO385,450,745,1375,13
10:GOTO95
110 '***** ENTER MAINTENANCE SCH
EDULE
```

```
115 CLS:PRINT@0,U$+STRING$(17,12
8);:PRINT@32," ENTER INTERVALS F
OR:  ";N$;:PRINT@64,STRING$(32,1
28);
120 PRINT@96," oIL CHANGE EVERY
 ..... MILES":PRINT@128,"
 OR WITHIN      .. MOS."
125 PRINT@192," lUBRICATE EVERY
  ..... MILES":PRINT@224,"
  OR WITHIN      .. MOS."
130 PRINT@288," tUNE UP EVERY
  ..... MILES":PRINT@320,"
  OR WITHIN      .. MOS."
135 PRINT@384," bELTS/ETC.EVERY
  ..... MILES":PRINT@416,"
  OR WITHIN      .. MOS."
140 PRINT@480,W$;:POKE1535,128:L
=114:Q=1
145 FORP=1TO4:FORC=1TO2:IFC=1THE
NN=5ELSEN=C
150 D$="":PRINT@L,CHR$(133);
155 GOSUB1440
160 IFA$="@"THEN1355ELSEIFASC(A$
)=8THEN710
165 IFASC(A$)=13THEN Z=LEN(D$):P
RINT@L,STRING$(Z+1,143);:PRINT@L
,D$;:D(Q)=VAL(D$):GOTO195
170 IFASC(A$)<48 ORASC(A$)>57 TH
EN155ELSED$=D$+A$:PRINT@L,D$;:D(
Q)=VAL(D$)
175 IFLEN(D$)=>N THEN 180 ELSEPR
INT@L+LEN(D$),CHR$(133);:GOTO155
180 PRINT@L+LEN(D$),CHR$(133);
185 GOSUB1440
190 IFASC(A$)=8THEN710ELSEIFASC(
A$)<>13THEN185
195 PRINT@L+LEN(D$),CHR$(143);:P
RINT@L+N+1,CHR$(143);:L=L+35:Q=Q
+1
200 NEXT C
205 L=L+26
210 NEXTP
215 PRINT@0,STRING$(32,191):PRIN
T@32,"     entries"+Z$+"correct";
:POKE1075,63:PRINT@52,"Yes";:POK
E1079,47:PRINT@56,"No"
220 GOSUB1440
225 B$="NY@":W=INSTR(B$,A$)
230 ONW GOTO115,240,1355:GOTO220
235 '***** REQUEST CURRENT DATA
240 CLS0:PRINT@0,U$;:PRINT@32,"C
URRENT DATA FOR: ";N$ :PRINT@64,
STRING$(32,128);:PRINT"LAST OIL
CHG.     ......     MILES?";:PRINT"
 DATE PERFORMED  ......    ?"
245 PRINT:PRINT"LAST LUBED
 ......     MILES?";:PRINT" DATE P
ERFORMED  ......    ?"
250 PRINT:PRINT"LAST TUNED
 ......     MILES?";:PRINT" DATE P
ERFORMED  ......    ?"
255 PRINT:PRINT"CKD BELTS&HOSES
 ......     MILES?";:PRINT" DATE P
ERFORMED  ......    ?":PRINT@480,
W$;:POKE1535,128
260 IFA=3THENPRINT@82,"new";STRI
NG$(6,128);"old";
265 IFA=3THENPRINT@121,"        ";
:PRINT@128-LEN(H$(1)),H$(1);:PRI
NT@152,LEFT$(H$(2),2);"/";MID$(H
$(2),3,2);"/";RIGHT$(H$(2),2);:P
RINT@217,"        ";:PRINT@224-LEN
(H$(3)),H$(3);:PRINT@248,LEFT$(H
$(4),2);"/";MID$(H$(4),3,2);"/";
RIGHT$(H$(4),2);
270 IFA=3THENPRINT@312,"        ";
:PRINT@320-LEN(H$(5)),H$(5);:PRI
NT@344,LEFT$(H$(6),2);"/";MID$(H
$(6),3,2);"/";RIGHT$(H$(6),2);:P
RINT@409,"        ";:PRINT@416-LEN
(H$(7)),H$(7);:PRINT@440,LEFT$(H
$(8),2);"/";MID$(H$(8),3,2);"/";
RIGHT$(H$(8),2);
275 '
280 L=112:Q=1:N=6
```

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```
285 FORP=1TO4:FORC=1TO2
290 D$="":PRINT@L,CHR$(133);
295 GOSUB1440
300 IFA$="@"THEN1355ELSEIFASC(A$
)=8THEN705
305 IFASC(A$)=13THEN Z=LEN(D$):P
RINT@L,STRING$(Z+1,143);:PRINT@L
,D$;:H$(Q)=D$:GOTO335
310 IFASC(A$)<48 ORASC(A$)>57 TH
EN295ELSED$=D$+A$:PRINT@L,D$;:H$
(Q)=D$
315 IFLEN(D$)=>N THEN320 ELSEPRI
NT@L+LEN(D$),CHR$(133);:GOTO295
320 PRINT@L+LEN(D$),CHR$(133);
325 GOSUB1440
330 IFASC(A$)=8THEN705ELSEIFASC(
A$)=13THEN335 ELSE325
335 PRINT@L+LEN(D$),CHR$(143);:P
RINT@L+N+1,CHR$(143);:L=L+32:Q=Q
+1
340 NEXT C
345 L=L+32
350 NEXTP
355 PRINT@0,STRING$(32,191):PRIN
T@32,"    entries"+Z$+"correct";
:POKE1075,63:PRINT@52,"Yes";:POK
E1079,47:PRINT@56,"No"
360 GOSUB1440
365 B$="NY@":W=INSTR(B$,A$)
370 ONW GOTO240,800,1355:GOTO360
375 '***** (A=1) NEW VEHICLE ENT
RY
380 Z$=CHR$(128)
385 CLS3:PRINT@0,U$+U2$;:PRINT@1
99,"name"+Z$+"you"+Z$+"will"+Z$+
"use"+Z$;:PRINT@231,Z$+"for"+Z$+
"this"+Z$+"vehicle"+Z$;:PRINT@48
0,W$;:POKE1535,128
390 PRINT@364,"            ";:PRINT@
364,"";:LINEINPUTN1$
395 PRINT@372,STRING$(12,175);:I
FN1$=""THEN385ELSEIF N1$="@"THEN
75
400 FORQ=1TO LEN(N1$):IFASC(MID$
(N1$,Q,1))<48 OR ASC(MID$(N1$,Q,
1))>90 THEN N1$="":GOTO385
405 NEXT Q
410 TEMP$=N$:N$=N1$:GOTO1170
415 CLS3:PRINT@266,"SAVING DATA"
;
420 OPEN"O",#1,N$+"/DAT"
425 FOR Q=1TO8:WRITE#1,D(Q),H$(Q
)
430 NEXT Q
435 CLOSE#1
440 GOTO965
445 '***** (A=2) CHECK FOR SERVI
CE DUE
450 CLS3:PRINT@0,U$;:PRINT@24,N$
;:PRINT@169,Z$+"what"+Z$+"is"+Z$
+"the"+Z$+Z$;:PRINT@201,Z$+"vehi
cle"+Z$+"name"+Z$;:PRINT@480,W$;
:POKE1535,128:PRINT@332,"
 ";:PRINT@332,"";
455 LINEINPUTN1$:PRINT@340,STRIN
G$(12,175);:TEMP$=N$:IFN1$=""AND
N$<>""THEN790ELSEIFN1$="@"THEN75
ELSEN$=N1$:GOTO1170
460 IFN$=""ORN$="@"THEN75
465 OPEN"I",#1,N$+"/DAT"
470 FOR Q=1TO8:INPUT#1, D(Q),H$(
Q)
475 H(Q)=VAL(H$(Q))
480 J(Q)=0:J1(Q)=0
485 NEXT Q
490 CLOSE#1
495 IFA=3THEN240
500 CLS3:PRINT@0,U$;:PRINT@24,N$
;:PRINT@196,Z$+"enter"+Z$+"curre
nt"+Z$+"mileage"+Z$;:PRINT@300,"
      ";:PRINT@480,W$;:POKE1535,
128
505 D$="":N=1
510 GOSUB1440
515 IFA$="@"THEN75ELSEIFASC(A$)=
8THEN700ELSEIFASC(A$)=13THEN545
520 IFASC(A$)<48 ORASC(A$)>57 TH
EN510 ELSE525
525 D$=D$+A$:PRINT@300,D$;
530 N=N+1:IF N<=6 THEN 510
535 GOSUB1440
540 IFASC(A$)=8THEN700ELSEIFASC(
A$)=13THEN545ELSE535
545 M(0)=VAL(D$)
550 FORQ=1TO7STEP2:IFM(0)<VAL(H$
(Q))THEN1365
555 NEXTQ
560 CLS3:PRINT@0,U$;:PRINT@24,N$
;:PRINT@197,Z$+"enter"+Z$+"curre
nt"+Z$+"date"+Z$;:PRINT@300,"
   ";:PRINT@480,W$;:POKE1535,128
:D$="":N=1
565 GOSUB1440
570 IFA$="@"THEN75ELSEIFASC(A$)=
8THEN715ELSEIFASC(A$)=13THEN625
575 IFASC(A$)<48 ORASC(A$)>57 TH
EN565
580 D$=D$+A$:PRINT@300,D$;
585 IFN=2THENV$=MID$(D$,1,2):IFV
AL(V$)>12 OR VAL(V$)=0 THEN 1030
590 IFN=4THENV$=MID$(D$,3,2):IFV
AL(V$)>31 OR VAL(V$)=0THEN1030
595 N=N+1:IFN<=6 THEN 565
600 GOSUB1440
605 IFASC(A$)=8THEN715ELSEIFASC(
A$)=13THEN610ELSE600
610 FORQ=2TO8STEP2:IFRIGHT$(D$,2
)<RIGHT$(H$(Q),2)THEN1030
615 IFRIGHT$(D$,2)=RIGHT$(H$(Q),
2)ANDLEFT$(D$,2)<LEFT$(H$(Q),2)T
HEN1030
620 NEXT Q
```

```
625 H$(0)=D$
630 FORT=1TO300:NEXTT
635 M$=STR$(M(0)):Z=LEN(M$):CLS3
:PRINT@0,U$;:PRINT@67,N$;"...":P
RINT@85-Z,M(0)" MILES";:PRINT@96
," MAINTENANCE DUE ";:POKE1117,
175:POKE1118,175:POKE1119,175
640 PRINT"FOR   /  /     ";:PRIN
T@117,LEFT$(H$(0),2);:PRINT@120,
MID$(H$(0),3,2);:PRINT@123,RIGHT
$(H$(0),2);
645 PRINT@128,STRING$(32,32);
650 FORQ=1TO7STEP2:M(Q)=D(Q)+H(Q
)
655 T$(1)="OIL CHANGE":T$(3)="LU
BE":T$(5)="TUNE UP":T$(7)="BELTS
/HOSES":IF M(0)>=M(Q)+1000THEN72
5
660 IF M(0)<M(Q)+1000 AND M(0)>M
(Q)-500 THEN735ELSEPRINTCHR$(143
);T$(Q);" IN";M(Q)-M(0);"MILES":
J(Q)=3
665 NEXT Q
670 GOSUB910
675 PRINT@487,"Print";:POKE1516,
47:PRINT@493,"Expenses";:POKE152
5,47:POKE1526,128:POKE1527,64
680 GOSUB1440
685 B$="PE@":W=INSTR(B$,A$)
690 ONW GOTO1040,1210,75:GOTO680
695 '***** BACKSPACE/CORRECTION
700 Z=LEN(D$):IFZ<1THEN510ELSED$
=LEFT$(D$,Z-1):PRINT@300,"
";:PRINT@300,D$;:N=N-1:GOTO510
705 Z=LEN(D$):IFZ<1THEN295ELSE D
$=LEFT$(D$,Z-1):PRINT@L,STRING$(
Z-1,143);CHR$(133);CHR$(143);:PR
INT@L,D$;:GOTO295
710 Z=LEN(D$):IFZ<1THEN155ELSE D
$=LEFT$(D$,Z-1):PRINT@L,STRING$(
Z-1,143);CHR$(133);CHR$(143);:PR
INT@L,D$;:GOTO155
715 Z=LEN(D$):IFZ<1 THEN 565ELSE
D$=LEFT$(D$,Z-1):PRINT@300,"
 ";:PRINT@300,D$;:N=N-1:GOTO565
720 '***** SERVICE 'FLAGS'
725 PRINTCHR$(191); T$(Q);" OVER
DUE":J(Q)=2
730 GOTO665
735 PRINT CHR$(159);T$(Q);" SVC
DUE":J(Q)=1
740 GOTO665
745 '***** (A=3) UPDATE RECORDS
750 CLS3:PRINT@0,U$;:PRINT@24,N$
;:PRINT@233,"Service"+Z$+"update
";:PRINT@297,"Expense"+Z$+"recor
d";
755 GOSUB1440
760 B$="ES@":W=INSTR(B$,A$)
765 ONW GOTO1300,775,75:GOTO755
770 '***** SERVICE UPDATE
775 CLS3:PRINT@0,U$;:PRINT@24,N$
;:PRINT@232,Z$+"new"+Z$+"data"+Z
$+"for"+Z$+Z$;:PRINT@264,Z$+"veh
icle"+Z$+"named"+Z$;:PRINT@480,W
$;:POKE1535,128:PRINT@331,"
   ";:PRINT@331,"";
780 LINEINPUTN1$:IFN1$="@"THEN75
ELSEIFN1$=""ANDN$<>""THEN790ELSE
IFN1$<>""THENN$=N1$
785 GOTO1170
790 PRINT@332,N$;:PRINT@340,STRI
NG$(12,175);:GOTO460
795 IFA=2THEN445ELSEIFA=3THEN775
:GOTO75
800 IFA=1THEN415ELSEIFA=3THEN810
:GOTO75
805 '***** WRITE UPDATES TO "/DA
T" FILE
810 CLS3:PRINT@266," SAVING DATA
 ";
815 OPEN"I",#1,N$
820 OPEN"O",#2,"TEMP/DAT"
825 FOR Q=1TO8:INPUT#1, B(Q),E$(
Q)
830 IF H$(Q)<>"" THEN E$(Q)=H$(Q
)
835 WRITE#2,B(Q),E$(Q)
840 NEXTQ
845 CLOSE
850 KILLN$+"/DAT":RENAME"TEMP/DA
T"TO N$+"/DAT":GOTO75
855 '***** CHK. VEH/NDX AND CRNT
/NDX
860 OPEN"I",#1,"VEH/NDX"
865 FORQ=1TO5
870 INPUT#1,N$(Q):IFN$(Q)=""THEN
885
875 IF EOF(1)=-1 THEN885
880 NEXTQ
885 CLOSE#1
890 IFA=0THENOPEN"I",#1,"CRNT/ND
X"ELSE75 ' *****READ FIRST TIME
ONLY
895 INPUT#1,N$
900 CLOSE#1:GOTO75
905 '*****  DATE CALCULATIONS
910 FOR Q=2TO8STEP2
915 MO(Q)=VAL(LEFT$(H$(Q),2)):DA
(Q)=VAL(MID$(H$(Q),3,2)):YR(Q)=V
AL(RIGHT$(H$(Q),2))
920 M0=VAL(LEFT$(H$(0),2)):D0=VA
L(MID$(H$(0),3,2)):Y0=VAL(RIGHT$
(H$(0),2))
925 Y(Q)=(Y0-YR(Q))*360
930 T$(2)="OIL CHANGE":T$(4)="LU
BE":T$(6)="TUNE UP":T$(8)="BELTS
/HOSES"
935 I(Q)=(((M0-1)*30+D0+Y(Q))-((
MO(Q)-1)*30+DA(Q)))
940 IF I(Q)>D(Q)*30-15 THEN PRIN
TCHR$(175); T$(Q);" BY CALENDAR"
```

```
:J1(Q-1)=1
945 NEXTQ
950 RETURN
955 CLS3:PRINT@0,U$+STRING$(6,12
8);:PRINT@21,"NEW VEHICLE";:PRIN
T@231,"NAME ALREADY USED";:SOUND
200,5:SOUND150,10:FORT=1TO425:NE
XT:GOTO385
960 '***** WRITE NEW VEH. TO FIL
E AND OPEN BLANK "/DTL" FILE
965 OPEN"O",#1,"VEH/NDX"
970 FORN=1TO5:WRITE#1,N$(N)
975 NEXT N
980 CLOSE#1
985 OPEN"O",#1,N$+"/DTL"
990 WRITE#1,A$(0),B$(0),C$(0)
995 CLOSE#1:GOTO75
1000 '***** CHECK MAX. # VEHICLE
S
1005 N=1
1010 IFN$(N)=N$THEN955
1015 IFN$(N)=""THENN$(N)=N$:M=N:
GOTO115
1020 N=N+1:IFN>5THENCLS3:PRINT@2
60,"LIMIT 5 VEHICLES";:FORT=0TO3
00:NEXTT:GOTO75
1025 GOTO1010
1030 CLS3:PRINT@264,"NOT A VALID
 DATE";:FORX=0TO300:NEXT
1035 GOTO560
1040 '***** PRINTOUT OF SERVICE
DUE
1045 PRINT@448," BE SURE THE PRI
NTER IS ONLINE "
1050 PRINT#-2,STRING$(6,13)
1055 PRINT@448,STRING$(32,175);
1060 PRINT#-2,TAB(28)"***MAINTEN
ANCE FOR "N$"***"
1065 PRINT#-2,TAB(28)LEFT$(H$(0)
,2);"/";MID$(H$(0),3,2);"/";RIGH
T$(H$(0),2);TAB(44)M(0)" MILES":
PRINT#-2,STRING$(80,61):PRINT#-2
,"Item:";TAB(30)"Due";TAB(40)"Ov
erdue";TAB(55)"Miles to go"
1070 FORQ=1TO7STEP2
1075 P(Q)=0:IFJ(Q)=2THENJ$(Q)="M
":T=43:GOTO1090 '****SVC. OVERDU
E 'FLAG'
1080 P(Q)=0:IFJ(Q)=1THENJ$(Q)="M
":T=31:GOTO1090 '****SVC. DUE 'F
LAG'
1085 P(Q)=0:IFJ1(Q)=1THENJ$(Q)="
C":T=31ELSE1095 '****DUE BY CALE
NDAR 'FLAG'
1090 P(Q)=1:PRINT#-2,TAB(3)T$(Q)
;TAB(T)J$(Q)
1095 M$=STR$(M(Q)-M(0)):IFJ(Q)=3
THENPRINT#-2,TAB(3)T$(Q);TAB(65-
LEN(M$))M$
1100 NEXTQ
1105 GOTO1130
1110 FORQ=1TO7STEP2:IFP(Q)=1THEN
1120 '****'FLAG' TO PRINT SVC. S
UMMARIES
1115 NEXTQ
1120 IFQ=1THEN1135ELSEIFQ=3THEN1
140ELSEIFQ=5THEN1145ELSEIFQ=7THE
N1155
1125 IFQ<7THEN1115ELSEPRINT#-2,"
PERFORMED ABOVE ITEMS .........
.......(MILEAGE & DATE FOR SERVI
CE UPDATE)";STRING$(5,13):GOTO12
10
1130 PRINT#-2,CHR$(13);TAB(15)"C
=Calendar interval, M=Mileage in
terval";STRING$(3,13):GOTO1110
1135 PRINT#-2,"CHECK LIST:";CHR$
(13);CHR$(13);TAB(3)"Change oil
and filter...check fluid levels
under hood...check for any
     leakage, battery corrosion,
 loose belts, etc.";STRING$(2,13
):GOTO1125
1140 PRINT#-2,CHR$(13);TAB(3)"Lu
be all fittings...oil door hinge
s and strikers, hood hinges, etc
...           check transmission
 & differential.  Inspect exhaus
t system.  Check for          da
mage under car.";STRING$(2,13):G
OTO1125
1145 PRINT#-2,CHR$(13);TAB(3)"Tu
ne up engine...change spark plug
s, air and fuel filters, check p
lug           wires and ignition
 system...check PCV and breather
...check timing and "
1150 PRINT#-2,TAB(3)"idle speed.
..choke action when applicable..
.check overall performance.";STR
ING$(2,13):GOTO1125
1155 PRINT#-2,CHR$(13);TAB(3)"Be
lts/hoses...check belt tension a
nd condition...hoses for softnes
s or          deterioration...cl
amps for tightness...radiator sh
ould be free of debris"
1160 PRINT#-2,TAB(3)"in cooling
fins, and should be free from le
akage. Also inspect brake lining
s  and operation.  Check tires
 for tread depth and even wear."
;STRING$(2,13):GOTO1125
1165 '***** CHECK MAX. 8 CHARACT
ERS
1170 IFLEN(N$)>8THENCLS3:PRINT@0
,U$;:PRINT@260,"ONLY 8 LETTERS A
LLOWED ";:N$=TEMP$:SOUND200,5:SO
UND150,10:FORT=1TO400:NEXT T:ON
A GOTO385,445,775,855
1175 ON A GOTO1005,1185,1185,855
1180 '*****  CHK. FOR NAME IN "V
```

```
EH/NDX"
1185 FORQ=1TO5:IFN$(Q)=N$THEN460
1190 IFN$(Q)=""THENCLS3:PRINT@0,
U$;:PRINT@260,"NO VEHICLE BY THA
T NAME";:SOUND200,5:SOUND150,10:
FORT=1TO450:NEXTT:N$=TEMP$:GOTO7
95
1195 NEXTQ
1200 CLS3:PRINT@260,"NO VEHICLE
BY THAT NAME";:FORT=1TO350:NEXT
T:GOTO795
1205 '***** CPTM COMPUTATION
1210 CLS3:SUM=0:PRINTU$;:PRINT@2
4,N$:PRINT@266,"please"+Z$+"wait
";
1215 FORQ=1TO150:B$(Q)="":NEXTQ
1220 OPEN"I",#1,N$+"/DTL"
1225 FORQ=1TO150:INPUT#1,A$(Q),B
$(Q),C$(Q):IFA$(Q)=""THEN1245
1230 IFEOF(1)=-1THEN1245
1235 SUM=SUM+VAL(B$(Q))
1240 NEXTQ
1245 CLOSE#1
1250 CLS3:PRINT@229,"start"+Z$+"
figuring"+Z$+"costs"+Z$+Z$+Z$;:P
RINT@261,Z$+Z$+Z$+"at"+Z$+"what"
+Z$+"mileage";STRING$(5,128);:PR
INT@364,"        ";
1255 PRINT@0,U$;:PRINT@24,N$;:PR
INT@364,"";:LINEINPUTMI$:PRINT@3
70,STRING$(14,175);:Z=LEN(MI$):I
FMI$=""THEN1250ELSEIFMI$="@"THEN
75
1260 FORQ=1TOZ:IFASC(MID$(MI$,Q,
1))<48ORASC(MID$(MI$,Q,1))>57THE
NMI$="":GOTO1250
1265 NEXTQ
1270 MI=VAL(MI$):Y=(M(0)-MI)/100
0
1275 CLS3:PRINTU$;:PRINT@24,N$;:
PRINT@99,STRING$(25,32);:PRINT@9
9,"FROM"MI"TO"M(0)"MILES";
1280 PRINT@163,STRING$(25,32);:P
RINT@163,"EXPENSE TOTAL:";:PRINT
@179,USING"$$###.##";SUM;
1285 PRINT@259," COST PER THOUSA
ND MILES ";:PRINT@291," OF DRIVI
NG:     ";:PRINT@307,USING"$$###.
##";INT(SUM*100/Y)/100;:PRINTCHR
$(32);
1290 PRINT@480,W$;:POKE1535,128
1295 A$=INKEY$:IFA$="@"THEN75ELS
E1295
1300 '***** LEAVE "MAIN/BAS" PRO
GRAM
1305 '
1310 OPEN"O",#1,"CRNT/NDX"
1315 WRITE#1,N$
1320 CLOSE
1325 IFA=5THEN1340 '*****CALLING
 IT QUITS
```

Coco Graphics Designer

Only $29.95

The Coco Graphics Designer produces beautiful Greeting Cards, Banners, and Signs for holidays, birthdays and other occasions.

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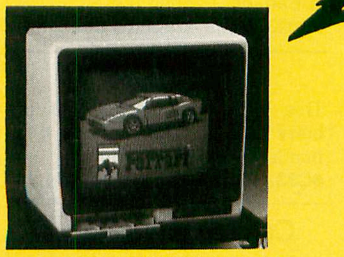
ZENITH



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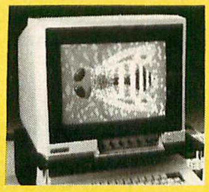

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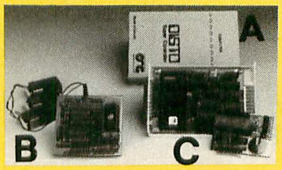
## DISTO



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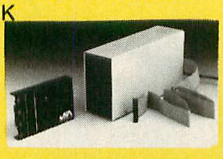

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VIP Writer III has a full featured screen editor which can be used to edit text with lines up to 240 characters long with or without automatic word wrap around. You can select type-over mode or insert mode. There is even an OOPS command to recall a cleared text buffer. Other editing features include: Type-ahead, typamatic key repeat and key beep for flawless text entry, end of line bell, full four way cursor control with scrolling, top of textfile, bottom of textfile, page up, page down, top of screen, bottom of screen, beginning of line, end of line, left one word, right one word, DELETE character, to beginning or end of line, word to the left or right, or entire line, INSERT character or line, LOCATE and/or CHANGE or DELETE single or multiple occurrence using wildcards, BLOCK copy, move or delete with up to TEN simultaneous block manipulations, TAB key and programmable tab stops, three PROGRAMMABLE FUNCTIONS to perform tasks such as auto column creation and disk file linking for continuous printing.

### TEXT FORMATTING

VIP Writer III automatically formats your text for you or allows you to format your text in any way you wish. You can change the top, bottom, left or right margin and page length. You can set your text flush left, center or flush right. You can turn right hand justification on or off. You can have headers, footers, page numbers and TWO auxiliary lines which can appear on odd, even or all pages. You can also select the line on which they appear! You can even change the line spacing! All of these parameters can be altered ANYWHERE within your text file.

### TEXT FILE COMPATIBILITY

VIP Writer III creates ASCII text files which are compatible with all other VIP Programs as well as other programs which use ASCII file format. You can use VIP Writer III to create BASIC, assembly, PASCAL or C files. VIP Writer III also allows you to save and load files using DISK or CASSETTE in the case of an emergency. You can even read disk directories, display free space on a disk and rename or kill disk files.

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### PREVIEW PRINT WINDOW

The VIP Writer III features a paper saving format window which allows you to preview your document BEFORE PRINTING IT! You are able to see centered text, margins, page breaks, orphan lines etc. This feature makes hyphenation a snap!

### PRINTING

VIP Writer III supports most any printer serial or parallel using the parallel interface described in Nov-Dec. '87 RAINBOW magazine, or an external serial to parallel interface, and gives you the ability to select baud rates from 110 to 9600. You are able to imbed printer control codes anywhere in your text file EVEN WITHIN JUSTIFIED TEXT! VIP Writer III also has twenty PROGRAMMABLE PRINTER SEQUENCES which allow you to easily control all of your printers capabilities such as underline, bold, italics, superscript and subscript using simple keystrokes. Additional printer features include: single sheet pause, print pause, word length and line feed selection.

### PRINT SPOOLING

VIP Writer III incorporates a built in print spooler with a 49,000 character buffer which allows you to print one document WHILE you are editing another. You no longer have to wait until your printer is done printing before starting another job!

### DOCUMENTATION

VIP Writer III is supplied with a 125 page instruction manual which includes a tutorial, glossary of terms and a complete index. The manual is well written and includes many examples to aid in understanding and application. VIP Writer III includes VIP Speller at **NO ADDITIONAL COST.** **DISK $79.95**
Cassette version does not include VIP Speller. **TAPE $59.95**

VIP Writer owners: Upgrade to the VIP Writer III Disk for $49.95 or Tape for $39.95. Send original product. Include $3 shipping.

## VIP WRITER - THE ORIGINAL

VIP Writer is also available for CoCo 1 and 2 owners and has all the features found in the VIP Writer III including VIP Speller except for the following: The screen display is 32, 51, 64 or 85 columns by 21 or 24 rows. Colors other than green, black or white are not supported. Help is not presented in colored windows. Double clock speed is not supported. Parallel printer interface is not supported. Print spooler is not available. Hard disk is not supported. Even so, the VIP Writer is a CoCo 1 or 2 owners best choice in word processors. VIP Writer includes VIP Speller at **NO ADDITIONAL COST.** **DISK $69.95**
Cassette version does not include VIP Speller. **TAPE $49.95**

## VIP SPELLER SPELLING CHECKER

VIP Speller works with ANY ASCII file created by most popular word processors. It automatically checks text files for words to be corrected, marked for special attention or even added to the dictionary. You can even view the misspelled word in context! VIP Speller comes with a specially edited 50,000 word dictionary, and words can be added to or deleted from the dictionary or you can create one of your own. **DISK $34.95**

Please add $3.00 for shipping and handling. COD orders add an additional $2.25. Personal checks allow 3 weeks for delivery. All other orders are shipped the same day.

```
1330 LOAD"EXPNS/BAS",R
1335 '***** (A=5)  QUIT
1340 CLS:NEW
1345 '
1350 PCLEAR1:GOTO55
1355 IFA=1THENN$=TEMP$:N1$="":A$
="":N$(M)="":GOTO75ELSE GOTO75
1360 '*****
1365 CLS3:PRINT@264,"NOT VALID M
ILEAGE";:FORX=0TO300:NEXT X:GOTO
500
1370 '***** (A=4) VEHICLE INDEX
SCREEN
1375 CLS:PRINTU$;:PRINT@19,"vehi
cle";CHR$(128);"index";
1380 PRINT:PRINT
1385 FORM=1TO5:PRINTN$(M),:NEXTM
1390 PRINT@480,W$;:POKE1535,128
1395 A$=INKEY$:IFA$<>"@"THEN1395
ELSE75
1400 '***** UTILITY TO INITIALIZ
E "VEHICLE INDEX" FILE
1405 'N$(1)="SAMPLE"
1410 OPEN"O",#1,"VEH/NDX"
1415 FOR Q=1TO5:WRITE#1,N$(Q):NE
XTQ
1420 CLOSE#1
1425 OPEN"O",#1,"CRNT/NDX"
1430 WRITE#1,N$(0)
1435 CLOSE#1:END
1440 A$=INKEY$:IFA$=""THEN1440EL
SE RETURN
1445 '*****MAIN MODULE/ BY L. AN
DERSON/ (C)1985
```

| | | | |
|---|---|---|---|
| 70 | 49 | 355 | 103 |
| 165 | 114 | 485 | 219 |
| 255 | 247 | END | 12 |

**Listing 2:** EXPNS

```
5  '*********EXPNS*********
10 '*********V1.01**********
    ***********************
15 '*****COPYRIGHT 1985*****
    **BY LARRY ANDERSON*****
20 CLEAR5000:DIMA$(150),B$(150),
C$(150)
25 Z$=CHR$(128):V$=STRING$(8,128
)+"@escapes"+Z$+"to"+Z$+"menu"+S
TRING$(7,128)
30 U$="r e m e m b e r"+STRING$(
17,128)
35 W$="<--LAST"+STRING$(5,128)+"
Exit"+STRING$(5,128)+"NEXT-->"
40 GOTO430
45 CLS3:PRINT@0,U$;:PRINT@24,N$:
PRINT@480,V$;:PRINT@233,Z$+Z$+"r
ecords"+Z$+"for"+Z$+Z$;:PRINT@26
5,Z$+"which"+Z$+"vehicle"+Z$;:PO
KE1535,128
50 PRINT@332,"        ";:PRINT@3
32,"";:LINEINPUT N1$:PRINT@340,S
TRING$(12,175);:IFN1$=""THEN65EL
SEIFN1$="@"THEN70
55 TEMP$=N$:N$=N1$
60 ON A GOTO480,480,405
65 IFN$<>""THENN1$="":PRINT@332,
N$;:ONA GOTO505,505,295:GOTO45
70 CLS3:PRINT@0,U$;:PRINT@24,N$:
PRINT@200,"Review";CHR$(128);"it
ems";:PRINT@264,"Update";CHR$(12
8);"items";:PRINT@328,"Main";CHR
$(128);"menu";STRING$(3,128);
75 F1$="DATE- ":F2$="AMOUNT- $":
F3$="DETAILS- "
80 GOSUB555
85 B$="RUM":A=INSTR(B$,A$)
90 ONA GOTO45,45,405:GOTO80
95 '*****
100 CLS3:PRINT@0,U$;:PRINT@24,N$
105 PRINT@232,"Add"+Z$+"records"
;STRING$(3,128);
110 PRINT@296,"Remove"+Z$+"recor
ds";
120 GOSUB555
125 B$="AR@":W=INSTR(B$,A$)
130 CLS:ONW GOTO140,210,70:GOTO1
20
135 '*****
140 RC=RC+1
145 CLS:PRINTU$+STRING$(3,128);:
PRINT@19," ADD# ";RC
150 PRINT@32,STRING$(3,143);:PRI
NT@48-LEN(N$)/2,N$
155 PRINT@480,STRING$(11,128);"@
"+Z$+"escapes";STRING$(11,128);:
POKE1535,128:PRINT@64,"";
160 PRINTF1$;:LINEINPUTA$(RC)
165 IFA$(RC)="@"THENA$(RC)="":GO
TO290
170 PRINTF2$;:LINEINPUTB$(RC)
175 IFB$(RC)="@"THENB$(RC)="":A$
(RC)="":GOTO290
180 PRINTF3$;:LINEINPUTC$(RC)
185 IFC$(RC)="@"THENC$(RC)="":A$
(RC)="":B$(RC)="":GOTO290
190 PRINT@480,STRING$(5,128);"ok
"+Z$+"to"+Z$+"enter"+Z$+"Yes No"
;STRING$(8,128);:POKE1524,47:POK
E1535,128
195 GOSUB555
200 B$="YN":W=INSTR(B$,A$)
205 ONW GOTO135,145:GOTO195
210 CLS(7):PRINT@0,U$;:PRINT@480
,V$;:POKE1535,128
```

```
215 PRINT@32,"record"+Z$+"remova
l";STRING$(4,128);
220 PRINT@50,"REC.#:";:LINEINPUT
Q$
225 IFQ$="@" THEN 70ELSE230
230 Q=VAL(Q$):IFQ>RC OR Q<1THEN2
10
235 PRINT@64,F1$;A$(Q):PRINTF2$;
B$(Q):PRINTF3$;C$(Q)
240 PRINT@480,STRING$(6,128);"re
move";STRING$(4,128);"Yes"+Z$+"o
r"+Z$+"No";STRING$(6,128);:POKE1
535,128
245 GOSUB555
250 B$="YN@":W=INSTR(B$,A$)
255 ONW GOTO260,210,70:GOTO245
260 A$(Q)=A$(0):B$(Q)=B$(0):C$(Q
)=C$(0)
265 FORN=Q TO RCD
270 A$(N)=A$(N+1):B$(N)=B$(N+1):
C$(N)=C$(N+1)
275 NEXTN
280 RCD=RCD-1:IF RCD<1THENRCD=0
285 GOTO295
290 RC=RC-1
295 CLS0:L1=LEN(N$)/2:C=207-L1:P
RINT@171," SAVING ";:PRINT@203,
"           ";:PRINT@C,N$;:PRINT@2
35,"DATA FILE";
300 PRINT@299,RCD;"RECORDS";
305 OPEN"O",#1,N$+"/DTL"
310 FORQ=1TO 150:IFA$(Q)=""THEN3
25
315 WRITE#1,A$(Q),B$(Q),C$(Q)
320 NEXTQ
325 CLOSE#1
330 GOTO70
335 '*****
340 CLS3:FORQ=1TO RC
345 CLS:PRINT@0,U$:PRINT@15,STRI
NG$(5,128);Q"OF"RC:PRINT@80-LEN(
N$)/2,N$
350 PRINT:PRINTF1$;A$(Q)
355 PRINTF2$;B$(Q)
360 PRINTF3$;C$(Q)
365 PRINT@482,W$;
370 GOSUB555
375 IFASC(A$)=9THEN395
380 IFA$="E"THEN70
385 IFASC(A$)=8THENQ=Q-1:IFQ<1TH
ENQ=RC
390 GOTO345
395 CLS3:NEXTQ
400 GOTO340
405 OPEN"O",#1,"CRNT/NDX"
410 WRITE#1,N$
415 CLOSE#1
420 LOAD"MAIN",R
425 '*****
430 OPEN"I",#1,"VEH/NDX"
435 FORQ=1TO5:INPUT#1,N$(Q)
440 IFEOF(1)=-1THEN450
445 NEXTQ
450 CLOSE#1
455 OPEN"I",#1,"CRNT/NDX"
460 INPUT#1,N$
465 CLOSE#1
470 GOTO70
475 '*****
480 FOR N=1TO5:IFN$(N)=N$ THEN50
0
485 IFN$(N)="" THENCLS3:PRINT@0,
U$;:PRINT@260,"NO VEHICLE BY THA
T NAME";:SOUND200,5:SOUND150,10:
FORT=1TO300:NEXT T:N$=TEMP$:GOTO
45
490 NEXT N
495 CLS3:PRINT@260,"NO VEHICLE B
Y THAT NAME";:SOUND200,5:SOUND15
0,10:FORT=1TO300:NEXTT:TEMP$=N$:
GOTO45
500 ONA GOTO505,505,405
505 IFN1$=""ANDA$(1)<>""THEN550E
LSEFORQ=1TO150:A$(Q)="":B$(Q)=""
:C$(Q)="":NEXTQ
510 OPEN"I",#1,N$+"/DTL"
515 FORQ=1TO150
520 IFEOF(1)=-1THEN540
525 INPUT#1,A$(Q),B$(Q),C$(Q)
530 IFA$(Q)=""THEN540
535 NEXTQ
540 RC=Q-1
545 CLOSE #1
550 ONA GOTO335,95,295
555 A$=INKEY$:IFA$=""THEN555ELSE
RETURN
```

**Listing 3:** REM

```
5 '*******TITLE SCREEN*******
  ***************************
10 '******FOR "REMEMBER"*******
  ***************************
15 '
20 CLS:T$="r e m e m b e r"
25 G$=CHR$(128)+" "+CHR$(159)+"
"+CHR$(255)+" "+CHR$(191)+" "+CH
R$(223)+" "+CHR$(175)+" "+CHR$(2
39)+" "+CHR$(207)
30 FORX=0TO150:PRINT@456,T$:NEXT
35 FORL=456TO39STEP-32:PRINT@L,T
$:PRINT@L+32,G$:NEXT
40 FORX=0TO300:NEXT
45 PRINT@352,"                 b y
        l a r r y   a n
d e r s o n"
50 FORX=0TO300:NEXT
55 PRINT@450,"C. 1985  BENTON,
LA. 71006"
60 LOAD"MAIN",R
```

*A polling program to track voting trends*

# Presidential Election Preview

**By Steve Blyn**
**Rainbow Contributing Editor**

This month's program is a political "thermometer" for students of all ages. It concerns the upcoming presidential election, which affects all of us.

*Election Preview* polls a test group, keeping score of, and updating, candidates' votes, and can be used in a variety of ways. We have used this program to track presidential candidates' true number of electoral votes, students' candidate preferences as time goes on, and classroom or schoolwide voting for various student elections.

The names of the top seven candidates for both parties are listed on the screen. The student "votes" by typing in his or her preference, or that of some authoritative source, and the candidate receives one point. The student merely types in the candidate's name. We purposely decided to have the student type in the name of the candidate rather than a number in order for the student to obtain practice in recognizing and spelling these names. One of them, after all, is bound to be our next president.

Bear in mind this program was written at the end of January, about the time of the Iowa primaries. By the time of publication, the list of probable candidates may very well be quite different. Governor Cuomo, for example, may announce his intention to become a candidate. At periodic intervals, you should update the program to include or delete candidates as events change. This is easily done by revising the names in the data statements in lines 260 through 320.

Each of the seven data lines contains the last name of a current Democratic candidate, his number of votes, the name of a current Republican and his current number of votes. The numbers all start out as zeros for placeholders. They are updated by the `DATA.DAT` file, which the user may optionally update each time the program is used.

After the student has finished his or her current polling, the S key may be pressed to save the current results. The E key is used to end the session. To begin a new session, the student must press the L key to load the saved information.

The information is optionally saved and loaded on disk for the convenience of the user, stored in a file called `DATA.DAT` on your disk. If additional independent surveys were taken on the same disk, the data of the second would wipe out the data of the first unless they were given different names.

For example, a second student named Freddy may take his own surveys, change the name of his file in lines 340 and 410 from `DATA` to `FREDDY`, and save this revised program as `FREDDY`. When Freddy uses the computer, he will load the program called `FREDDY` and the file used will automatically be `FREDDY.DAT`. This procedure can be repeated for all of the student users if desired.

Program lines 30 and 40 dimension and read in the data. You may alter these two lines if the list of candidates becomes significantly shorter or longer. We chose seven of each as a safe middle ground.

Lines 60 through 140 set up and print the screen. Lines 150 and 160 ask for the user's current choice or update. Lines 200 through 230 add a value of 1 to that candidate's score.

Line 170 checks to see whether the E key was pressed to end the program. Line 180 checks for the L key and will load the data file: This routine is on lines 410 through 450. Line 190 checks for the S key and saves the data file: This routine is on lines 340 through 380. If you want to preserve your current data, be sure to save the file before ending the program.

If you choose never to use the files option, then there is no need to type in the two routines mentioned above. You would key in the program up to Line 320. Lines 180 and 190 would also be unnecessary.

We hope that you and your children/students can use this program to help make our country's electoral process more meaningful. Remember that your personal teaching and input into the children's understanding is the most valuable tool of all. As always, Computer Island appreciates hearing about the children's experiences and reactions to our programs. □

---

*Steve Blyn teaches both exceptional and gifted children, holds two master's degrees and has won awards for the design of programs to aid the handicapped. He owns Computer Island and lives in Staten Island, New York.*

**The listing:** `ELECTION`

```
10 REM"ELECTION PREVIEW"
20 REM"<C>STEVE BLYN,COMPUTER IS
LAND,STATEN ISLEAND,NY,1988"
30 DIM A$(7),B$(7),A(7),B(7)
40 FOR T=1 TO 7:READ A$(T),A(T),
B$(T),B(T):NEXT T
50 N=0:CLS:Q$=STRING$(32,239)
60 PRINT@5,"OUR  ELECTION  PREVI
EW";:PRINT@32,Q$
70 PRINT@64,"  DEMOCRATS       R
EPUBLICANS":PRINT@96,Q$
```

```
80 SOUND 200,3:N=0:FOR T=1 TO 7:
PRINT@128+N,A$(T);
90 PRINT@138+N,A(T);
100 N=N+32:NEXT T
110 N=0:FOR T=1 TO 7:PRINT@143+N
,CHR$(233)+" "+B$(T);
120 PRINT@352,Q$
130 PRINT@156+N,B(T);
140 N=N+32:NEXT T
150 PRINT@416," ":PRINT@416,"YOU
R CHOICE IS ";
160 INPUT C$
170 IF C$="E" THEN 250
180 IF C$="L" THEN GOTO 410
190 IF C$="S" THEN GOTO 340
200 FOR Y=1 TO 7
210 IF C$=A$(Y) THEN A(Y)=A(Y)+1
:GOTO 50
220 IF C$=B$(Y) THEN B(Y)=B(Y)+1
:GOTO 50
230 NEXT Y
240 GOTO 150
250 PRINT@416," VOTING COMPLETED
.....THANKYOU";:END
260 DATA HART,0,BUSH,0
270 DATA JACKSON,0,DOLE,0
280 DATA SIMON,0,KEMP,0
290 DATA DUKAKIS,0,ROBERTSON,0
300 DATA GORE,0,HAIG,0
310 DATA GEPHARDT,0,DUPONT,0
320 DATA BABBITT,0,KIRKPATRICK,0
330 REM OPTION TO SAVE THE FILE
340 PRINT@448,"saving data";:OPE
N"O",#1,"DATA"
350 FOR T= 1 TO 7
360 WRITE #1,A$(T),A(T),B$(T),B(
T)
370 NEXT T
380 CLOSE #1
390 GOTO 50
400 REM OPTION TO LOAD THE FILE
410 PRINT@448,"loading data";:OP
EN"I",#1,"DATA"
420 FOR T= 1 TO 7
430 INPUT #1,A$(T),A(T),B$(T),B(
T)
440 NEXT T
450 CLOSE #1
460 GOTO 50
```

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# NOVICES NICHE

THE RAINBOW is a teaching environment and we realize that the majority of our readers will always be beginners. In our continuing effort to always keep the new user in mind, and in addition to the many beginner feature articles and programs published in every issue, "Novices Niche" contains shorter BASIC program listings that entertain as well as help the new user gain expertise in all aspects of the Color Computer: graphics, music, games, utilities, education, programming, etc.

## Utility

## Backup and Restore

16K
Disk

### By Carl England

Most disk crashes are actually directory crashes. Sometimes the crash occurs when you try to save data while using the high-speed poke. Sometimes it occurs when you're trying to read or write to a direct access file record that doesn't exist, and sometimes it is just caused by gremlins on your disk. My program, *BRU*, allows you to restore files you thought would be lost forever.

*BRU* was designed to back up just the directory, allowing you to keep a file copy of your directory in case the gremlins get you. Eight unused sectors on Track 17 (where the directory is found) are used to store the backup. A directory normally uses 10 sectors, so I had to find a way to compress the backup into eight.

Lines 100 through 150 contain a trap that checks for data that may already exist on the sectors *BRU* uses to back up the directory. Some programs, especially those that run under OS-9, may use these sectors, and you may overwrite valuable data if you use *BRU* on them, so be careful. Line 260 is a trap to prevent you from attempting to restore a directory that has not been backed up.

*BRU* is simple to use — just load it and follow the prompts. Though it won't recover from crashes that involve data, it can provide useful and rapid recovery from directory crashes, which by far comprise most of all disk crashes. For a quick test to see that *BRU* is working properly, save a file on a blank formatted disk, run *BRU* and select Option 1. Kill the file, run *BRU* again and select Option 2. You should now be able to load the killed file.

**The listing:** BRU

```
10 'BACK UP AND RESTORE DIRECTOR
Y
20 'COPYRIGHT (C) 1987
30 'CARL ENGLAND
40 CLS:CLEAR5000
50 PRINT"<1> BACKUP DIRECTORY
60 PRINT"<2> RESTORE DIRECTORY
70 I$=INKEY$:IFI$<"1"ORI$>"2"THE
N70
80 ONVAL(I$)GOTO90,260
90 FORI=13TO18
100 DSKI$0,17,I,A$,B$
110 IFB$="BRU"+STRING$(125,255)T
HEN160
120 IFA$=STRING$(128,255)ANDB$=A
$THEN150
130 PRINTA$B$:PRINT"TRACK 17, SE
CTOR"I:PRINT"CONTAINS DATA.  DO
YOU WISH TO  OVERWRITE IT?
140 I$=INKEY$:IFI$="N"THENENDELS
EIFI$<>"Y"THEN140
150 NEXT
160 DSKI$0,17,2,A$,B$:B$="BRU"+S
TRING$(125,255):DSKO$0,17,13,A$,
B$
170 FORI=3TO12STEP2
180 DSKI$0,17,I,A$,B$:DSKI$0,17,
I+1,C$,D$
190 A$=A$+LEFT$(B$,112):C$=C$+LE
FT$(D$,112)
```

```
200 B$="":D$=""
210 FORJ=0TO7
220 B$=B$+MID$(A$,J*32+1,16):D$=
D$+MID$(C$,J*32+1,16)
230 NEXT
240 DSKO$0,17,(I+25)/2,B$,D$
250 NEXT:END
260 DSKI$0,17,13,A$,B$:IFB$<>"BR
U"+STRING$(125,255)THENCLS:PRINT
"ERROR:",,"DISK DOES NOT CONTAIN
 BRU FILE":END
270 DSKO$0,17,2,A$,B$
280 FORI=3TO12STEP2
290 DSKI$0,17,(I+25)/2,A$,B$
300 GOSUB350
310 DSKO$0,17,I,C$,D$
320 A$=B$:GOSUB350
330 DSKO$0,17,I+1,C$,D$
340 NEXT:END
350 C$="":D$=""
360 FORJ=0TO3
370 C$=C$+MID$(A$,J*16+1,16)+STR
ING$(16,255)
380 D$=D$+MID$(A$,J*16+65,16)+ST
RING$(16,255)
390 NEXT:RETURN
```

---

**Fun**

# Undercover CoCo

16K
ECB

## By David Compton

Almost everyone has experimented with "secret codes" at one time or another, and many work the cryptograms in the daily paper. These codes, which are technically simple substitution codes, are time-consuming to construct, and it is easy to make a mistake when working from the original to the cipher.

Now CoCo takes the work out of constructing cryptograms for you. Just run *Encrypt* and, in a few seconds, CoCo generates a new code. Type in your message, and it will be encoded. If you have a printer, you can print it out and give your friends a challenge. (To be fair, you should make your message long so they'll have a better chance of cracking the code.)

There's a small chance that the cipher alphabet won't appear a few seconds after the normal alphabet, as it should. If the computer has not substituted 'Z' for another letter by the time it reaches 'Z', it will go into an infinite loop trying to find another letter. Just press BREAK and run again.

**The listing:** ENCRYPT

```
10 REM ENCRYPT
20 REM COPYRIGHT (C) 1987
25 REM BY DAVID COMPTON
30 CLS
40 CLEAR1000
50 AL$(1)="ABCDEFGHIJKLMNOPQRSTU
VWXYZ":AL$(2)=AL$(1)
60 PRINTAL$(1)
70 CR=RND(-TIMER)
80 FORX=1TO26
90 CR=RND(26)
100 IFMID$(AL$(1),CR,1)=" "THEN9
0
110 CR$=CR$+MID$(AL$(1),CR,1)
120 IFMID$(CR$,CR,1)=MID$(AL$(1)
,CR,1)THENCR$=LEFT$(CR$,LEN(CR$)
-1):GOTO90
130 MID$(AL$(1),CR,1)=" "
140 NEXT
150 PRINTCR$
160 PRINT:PRINT"MESSAGE:"
170 LINEINPUTM$
180 M=LEN(M$)
190 DIMM$(M)
200 FORY=1TOM
210 F=INSTR(AL$(2),MID$(M$,Y,1))
220 IFF=0THENMC$=MC$+MID$(M$,Y,1
):GOTO240
230 MC$=MC$+MID$(CR$,F,1)
240 NEXTY
250 PRINTMC$
260 PRINT
270 INPUT"HARDCOPY (Y/N)";Y$
280 IFLEFT$(Y$,1)="Y"THENPRINT#-
2,MC$:END
290 IFLEFT$(Y$,1)="N"THENEND
300 GOTO270
```

```
MCSSCQ UVJ EIYBLCQ UC I FCFC
"ACU CM DCSH." UVJ EIYBLCQ YT
UVJ CBSX RIDIOYBJ ZNTU MCE XCNE
UIBHX FCFC 1, 2 IBH 3 IBH QYSS
RJJU XCNE FCRANUYBD BJJHT MCE
LNTYBJTT IBH ASJITNEJ. LJ TNEJ
UC UNBJ YB BJWU RCBUV MCE CNE
AEYBUJE YTTNJ!
```

**Calling all cryptologists! If you think you have figured out this encrypted message, send the translation to us here at THE RAINBOW by May 1, 1988. If you're right, you could win a copy of *The Third Rainbow Book of Adventures* and its companion tape or disk (be sure to specify which). In case of a tie, we will hold a drawing. Send your entry to The Cryptogram Contest, c/o Novices Niche, The Falsoft Building, 9509 U.S. Highway 42, P.O. Box 385, Prospect, KY 40059.**

# CoCo Caliber

16K
ECB

### By Brian DeMarco

Ready, aim, fire! Set your sights for action on the shooting range with *Shoot 'em*. Use your left and right arrow keys to take aim, and press the space bar to fire.

**The listing:** SHOOTEM

```
2 CLS
3 CLEAR2000
4 T$=CHR$(136)+CHR$(132)
5 DIM A$(3)
6 PO=495
10 A=RND(-TIMER)
20 A$(1)=STRING$(255,32):A$(2)=S
TRING$(255,32):A$(3)=STRING$(255
,32)
30 FORX=1TO100
40 R=RND(254):IF MID$(A$(1),R,1)
<>CHR$(175) THEN MID$(A$(1),R,1)
=CHR$(175):MID$(A$(2),R,1)=CHR$(
159):MID$(A$(3),R,1)=CHR$(175):N
EXTX ELSE GOTO 40
50 M1=RND(254):M2=RND(254):M3=RN
D(254)
55 PRINT@PO-1,T$;
56 E1=300
60 Y$=INKEY$:IF Y$="" THEN GOSUB
 490:GOTO60
61 IF Y$=CHR$(8) AND PO-1>480 TH
EN PRINT@PO-1,CHR$(32)+CHR$(32);
:PO=PO-1:PRINT@PO-1,T$;:GOTO60
62 IF Y$=CHR$(9) AND PO<510 THEN
 PRINT@PO-1,CHR$(32)+CHR$(32);:P
O=PO+1:PRINT@PO-1,T$;:GOTO60
70 FORX=PO-32 TO PO-480 STEP -32
75 IFX=E1 THEN E1=0
76 IF X=E2 THEN E2=0
80 IF PEEK(1024+X)=175 OR PEEK(1
024+X)=159THEN 100 ELSE 90
90 PRINT@X,CHR$(133);:NEXTX
95 GOTO 120
100 IF X>128 AND X<159 THEN MID$
(A$(3),M3+(X-128),1)=CHR$(32) EL
SE IF X>64 AND X<95 THEN MID$(A$
(2),M2+(X-64),1)=CHR$(32) ELSE I
F X>0 AND X<31 THEN MID$(A$(1),M
1+(X-0),1)=CHR$(32)
110 GOTO90
120 FOR X=PO-32 TO PO-480  STEP
-32:PRINT@X,CHR$(32);:NEXTX:GOTO
60
490 GOSUB1000:M1=M1+1:M2=M2-1:M3
=M3+1:IF M1=255 THEN M1=1 ELSE I
F M2=1 THEN M2=255 ELSE IF M3=25
5 THEN M3=1
500 PRINT@0,MID$(A$(1),M1,32):PR
INT@64,MID$(A$(2),M2,32):PRINT@1
28,MID$(A$(3),M3,32):RETURN
1000 IF E1=0 THEN E1=PO-480
1010 IF E2=0 THEN E2=RND(31)-1
1020 PRINT@E1,CHR$(32);:PRINT@E2
,CHR$(32);:E1=E1+32:E2=E2+32
1030 IF E1>511 THEN E1=0
1035 IF E2>511 THEN E2=0
1040 PRINT@E1,CHR$(134+64);:PRIN
T@E2,CHR$(134+64);:IF PEEK(PO+10
24)=134+64 OR PEEK(PO-1+1024)=13
4+64 THEN END ELSE RETURN
```

## Home Help

# A CoCo Pop-Up Calendar

4K

### By Fred Kolesar

Picture this: You're laboring away at the CoCo and need to know the date of the first Saturday in May. Ransacking your desk yields no calendar. Then you remember — there's a calendar installed as a subroutine in the very program you're using. A few quick keystrokes and the information is found.

*Calendar* is, of course, a program in its own right. But if you opt to add *Calendar* to another program as a subroutine, you'll need to keep your variables separate. *Calendar* uses these five variables: L — loop start value for the PRINT TAB(P) F/N loop; P — PRINT TAB position; D — day of the month; M — month of the year; and M$ — month names. If the larger program uses any of these variables, you will need to rename *Calendar*'s.

To change the calendar to another year, just change the date in Line 5 from 1988 to the year you want displayed. Edit Line 1 and set the variable L to the print position of the first day of that year (Sunday, L=2; Monday, L=6; Tuesday, L=10; Wednesday, L=14; Thursday, L=18; Friday, L=22; Saturday, L=26). January 1, 1988, was on a Friday, so Variable L has a value of 22 this year. Since 1988 is a leap year, you'll need to change the value on Line 2 from IF D=29 AND M=2 to IF D=28 AND M=2 for non-leap years. Press the space bar to advance to the month you want.

To end *Calendar*, just press the CLEAR key. To escape the program as a subroutine, edit Line 4 and change the statement END to RETURN.

**The listing:** CALENDAR

```
0 'calendar' by: fred kolesar
  7 ladd road,  westfield,pa
  16950         4/87
1 L=22:M=0:GOSUB5:M$="JANFEBMARA
```

```
PRMAYJUNJULAUGSEPOCTNOVDEC
2 FORP=L TO26STEP4:D=D+1:PRINTTA
B(P)D;:IFD=29ANDM=2GOSUB4ELSEIFD
=30THENIFM=4ORM=6ORM=9ORM=11GOSU
B4ELSEELSEIFD=31GOSUB4
3 NEXT:PRINT:L=2:GOTO2
4 EXEC44539:IFPEEK(135)=12THENEN
D
5 IFM=12THEN1ELSECLS0:D=0:PRINT@
76,MID$(M$,M*3+1,3)" 1988";:M=M+
1:PRINT@192,"  SUN MON TUE WED T
HU FRI SAT":RETURN
```

## CoCo 3 Graphics

# High-Tech Quilting Bee

CoCo 3

### By Bernice M. Shoobs

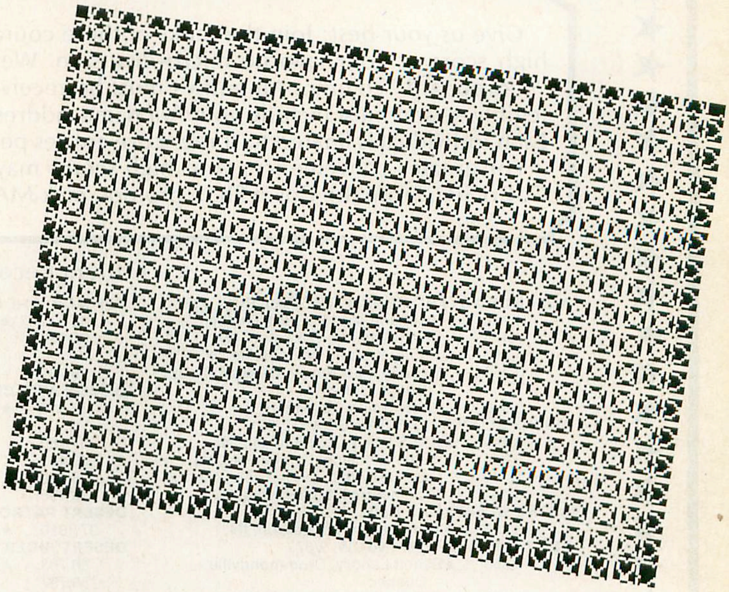
I call my program *Quilt*, but you can call it a game, tapestry, window shade, wall hanging or whatever you want. The program creates designs on your PMODE 4 screen with the use of the composite monitor (to see the simulated colors).

The designs are created by concentric and overlapping circles forming vertically down the screen. When prompted, the user inputs the *x* step increment, the *y* step increment and the radius of the circle. Keeping the *x* and *y* increment values between step 5 and step 20 and keeping the radius value between 6 and 25 make the most striking designs.

*Quilt* begins by giving the user some sample *x*, *y* and radius figures, which I have found to produce interesting patterns. Once you get the idea and begin to see the patterns take form, use your imagination. Some advice: Do not make the increments extremely small while the radius is large, and vice versa. Also, let the entire pattern develop before you decide to break the program. You will be surprised at the results.

**The listing:** QUILT

```
10 CLS
20 ON BRK GOTO 220
30 F1$="     ###          ###
   ###"
40 PRINT @0,"BEGIN MAKING PATTER
NS WITH THESE"
50 PRINT @40,"NUMBERS THEN--"
60 PRINT@67,"C R E A T E  YOUR
O W N !"
70 PRINT@96,STRING$(32,"-")
80 PRINT@128,"X INCREMENT  Y INC
REMENT  RADIUS"
90 PRINT@160,STRING$(32,"-"):GOS
UB 270:RESTORE
100 REM  **********************
110 REM
120 INPUT"NO. OF X STEP INCREMEN
T";A
130 INPUT "NO. OF Y STEP INCREME
NT";B
140 INPUT "NO. RADIUS OF CIRCLE"
;C
150 WIDTH 32
160 PMODE 4,1:PCLS:SCREEN 1,1
170 FOR X=0 TO 255 STEP A
```



```
180 FOR Y=0 TO 191 STEP B
190 CIRCLE (X,Y),C
200 NEXT Y,X
210 FOR T=1 TO 2400:NEXT T
220 CLS
230 INPUT "ANOTHER ONE? <Y/N> ";
A$
240 IF A$="Y" THEN 10 ELSE END
250 REM ******************
260 REM
270 READ X,Y,C
280 IF X=99 THEN RETURN
290 PRINT USING F1$;X,Y,C
300 GOTO 270
310 DATA 11,11,17
320 DATA 10,7,10
330 DATA 12,10,21
340 DATA 13,6,11
350 DATA 16,8,14
360 DATA 5,10,15
370 DATA 99,99,99
```

**Submissions to "Novices Niche" are welcome from everyone. We like to run a variety of short programs that can be typed in at one sitting and are useful, educational and fun. Keep in mind, although the short programs are limited in scope, many novice programmers find it enjoyable and quite educational to improve the software written by others.**

**Program submissions must be on tape or disk. We're sorry, but we cannot key in program listings. All programs should be supported by some editorial commentary, explaining how the program works. If your submission is accepted for publication, the payment rate will be established and agreed upon prior to publication.**

# RAINBOW

*Give us your best:* Join the ranks of these courageous CoCoists in showing the Color Computer world your high score at your favorite micro-diversion. We want to put your best effort on record in THE RAINBOW's "Scoreboard" column. All entries must be received 60 days prior to publication. Entries should be printed — legibly — and must include your *full* name, address, game title, company name and, of course, your high score. Each individual is limited to three score entries per month. Send your entries to Scoreboard, c/o THE RAINBOW.

For greater convenience, your high scores may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type `SEND` and address to: `EDITORS`.

★ Current Record Holder  ● Shutout

**ADVANCED STAR*TRENCH** (THE RAINBOW, 7/86)

| | |
|---|---|
| 4,750 | ★Stephane Martel, Laval, Quebec |
| 4,475 | David Schaller, Clarkston, WA |
| 4,300 | Jeffrey Warren, Waynesville, NC |
| 3,960 | Maurice MacGarvey, Dawson Creek, British Columbia |
| 3,960 | Robbi Smith, Helena, HI |

**ALPINE SLOPES** (THE RAINBOW, 12/85)

| | |
|---|---|
| 13,140 | ★Ron Silvestro, Lindenwold, NJ |
| 9,880 | Walter Schilling, Lindenwold, NJ |
| 7,340 | Gary Demerest, Lindenwold, NJ |
| 6,110 | Rick McElroy, Lindenwold, NJ |

**ASTRO BLAST** *(Mark Data)*

| | |
|---|---|
| 48,825 | ★Tony Bacon, Mt. Vernon, IN |

**BEE ZAPPER** (THE RAINBOW, 9/87)

| | |
|---|---|
| 9,650 | ★Benoit Landry, Drummondville, Quebec |
| 9,450 | Phillip Holsten, Modesto, CA |

**BIOSPHERE** *(Radio Shack)*

| | |
|---|---|
| 47,360 | ★Upton Thomas, Arnold, MD |

**BUZZARD BAIT** *(Tom Mix)*

| | |
|---|---|
| 22,931,850 | ★Skip Taday, East Lyme, CT |
| 763,550 | Geran Stalker, Rivordalo, GA |
| 187,750 | Keith Janas, Kitwanga, British Columbia |

**CANYON CLIMBER** *(Radio Shack)*

| | |
|---|---|
| 1,627,500 | ★Matthew Fumich, Munford, TN |
| 202,000 | David Brown, New Waterford, Nova Scotia |
| 178,200 | Darren King, Yorkton, Saskatchewan |
| 169,000 | Gregory Speer, Emporia, KS |
| 165,500 | Sara Mittelstaedt, Kiel, WI |
| 159,200 | Upton Thomas, Arnold, MD |
| 150,200 | Brian Lewis, Baltimore, MD |
| 141,400 | Michael Petry, Kansas, AL |
| 135,600 | Eric Rose, Grand Coulee, WA |
| 130,400 | Joanna Wanagel, Freeville, NY |

**CLOWNS & BALLOONS** *(Radio Shack)*

| | |
|---|---|
| 688,960 | ★Faye Keefer, Augusta, GA |
| 70,180 | Charles Andrews, Delta Jct, AK |
| 36,650 | Melody Webb, Lakeport, CA |
| 15,950 | Matthew Smith, Courtenay, British Columbia |

**COLOR CAR** *(NOVASOFT)*

| | |
|---|---|
| 218,773 | ★Alan Martin, Cornwall, Ontario |

**COLOR POKER** (THE RAINBOW, 4/83)

| | |
|---|---|
| 21,504,600 | ★Earl Foster, Lynchburg, VA |

**CRYSTLE CASTLES** *(ThunderVision)*

| | |
|---|---|
| 554,979 | ★Patrick Martel, Laval, Quebec |
| 60,107 | Alphonse Brown, Houston, TX |

**DALLAS QUEST** *(Radio Shack)*

| | |
|---|---|
| 81 | ★Brad Wilson, Lithia Springs, GA |
| 85 | David and Shirley Johnson, Leicester, NC |
| 86 | Roy Grant, Toledo, OH |
| 86 | Melanie Moor, Florence, AL |
| 86 | Paul Summers, Orange Park, FL |
| 87 | Douglas Bell, Duncan, OK |
| 89 | Chris Piche, White Rock, British Columbia |
| 89 | Milan Parekh, Fullerton, CA |
| 89 | Andrew Urquhart, Metairie, LA |
| 89 | Steve Zemaitis, Howell, MI |

**DECATHALON** *(Spectral Associates)*

| | |
|---|---|
| 10,400 | ★Tom DiVittorio, Glassboro, NJ |
| 7,440 | Wayne Hufford, Kincardine, Ontario |
| 7,216 | Martin Parada, Arcadia, CA |

**DEFENSE** *(Spectral Associates)*

| | |
|---|---|
| 16,305 | ★Patrick Martel, Laval, Quebec |

**DEF MOV** (THE RAINBOW, 1/87)

| | |
|---|---|
| 35,331 | ★David Schaller, Clarkston, WA |
| 30,253 | Benoit Landry, Drummondville, Quebec |
| 25,739 | John Weaver, Amsterdam, NY |

**DEMON ATTACK** *(Imagic)*

| | |
|---|---|
| 72,410 | ★Glenn Hodgson, Aberdeenshire, Scotland |
| 67,760 | Jim Davis, Sandwich, IL |
| 40,435 | Upton Thomas, Arnold, MD |
| 28,780 | Daniel Streidt, Cairo, Egypt |
| 16,995 | Todd VanNatta, Isle of Palms, SC |

**DESERT PATROL** *(Arcade Animation)*

| | |
|---|---|
| 377,050 | ★Jason Lakes, Franklin, OH |

**DESERT RIDER** *(Radio Shack)*

| | |
|---|---|
| 80,703 | ★Thomas Payton, Anderson, SC |
| 50,797 | Patrick Devitt, Lombard, IL |
| 26,125 | Ryan Grady, Newbury Park, CA |
| 24,355 | Roby Janssen, Clear Lake, IA |

**DEVIL ASSAULT** *(Tom Mix)*

| | |
|---|---|
| 1,866,100 | ★Stephane Martel, Laval, Quebec |
| 623,550 | Dale Krueger, Maple Ridge, British Columbia |
| 75,000 | Blake Cadmus, Reading, PA |
| 40,800 | Benoit Landry, Drummondville, Quebec |

**DISCRIMINATION** (THE RAINBOW, 1/87)

| | |
|---|---|
| 15 | ★Patrick Martel, Laval, Quebec |

**DONPAN** *(Radio Shack)*

| | |
|---|---|
| 53,100 | ★Jim Davis, Sandwich, IL |
| 52,600 | Eric Olson, Wheaton, IL |

**DOUBLE BACK** *(Radio Shack)*

| | |
|---|---|
| 172,320 | ★Richard Winkelbauer, Bronx, NY |
| 136,510 | Don Mullis, Delavan, WI |
| 51,470 | Betty Mullis, Delavan, WI |
| 50,700 | Tristan Terkuc, Richmond, Ontario |
| 34,990 | Darren Lowe, White Rock, British Columbia |

**DOWNLAND** *(Radio Shack)*

| | |
|---|---|
| 99,980 | ★Danny Wimett, Rome, NY |
| 98,985 | Karl Gulliford, Summerville, SC |
| 97,740 | Stephane Deshaies, Beloeil, Quebec |
| 89,490 | Neil Edge, Williston, FL |
| 77,254 | Tom Audas, Fremont, CA |
| 73,346 | Jean-Francois Morin, Loretteville, Quebec |
| 70,142 | Chris Goodman, Baltimore, MD |
| 68,142 | Cooper Valentin, Vavenby, British Columbia |
| 67,721 | Keith Yampanis, Jaffrey, NH |
| 62,442 | Eddie Lawrence, Pasadena, Newfoundland |
| 55,300 | Patrico Gonzalez, Buenos Aires, Argentina |
| 49,500 | Danny Perkins, Clifton Forge, VA |
| 49,441 | Kevin Pater, Port Alberni, British Columbia |
| 49,254 | David Brown, New Waterford, Nova Scotia |
| 43,502 | Mike Ells, Charlotte, MI |
| 41,896 | Antonio Hidalgo, San Jose, Costa Rica |
| 40,360 | Jesse Binns, Phoenix, AZ |
| 34,424 | Andrea Mayfield, Melbourne, FL |
| 25,148 | Michelle Murray, Salem, IN |
| 25,147 | Timothy O'Neal, Commerce, TX |
| 22,739 | Kyle Sheppard, Fairview, NC |

**DRAGON BLADE** *(Prickly-Pear)*

| | |
|---|---|
| 69 | ★Anna Kurtz, Bath, IN |

**DRAGON FIRE** *(Radio Shack)*

| | |
|---|---|
| 160,835 | ★Eric Olson, Wheaton, IL |
| 146,325 | Stephane Martel, Laval, Quebec |
| 9,861 | Michael Adams, Columbia, SC |
| 5,561 | Chris Lorenz, Kiester, MN |

**DRAC** *(Tom Mix)*

| | |
|---|---|
| 104,850 | ★Don Mullis, Delavan, WI |

**ESCAPE 2012** *(Computerware)*

| | |
|---|---|
| 202 | ★Roy Grant, Toledo, OH |

**FIRE COPTER** *(Adventure International)*

| | |
|---|---|
| 77,030 | ★Mike LeBrun, Cornwall, Ontario |
| 56,840 | Michael Adams, Columbia, SC |

**FIRESTORM** (THE RAINBOW, 1/86)

| | |
|---|---|
| 22,505 | ★Chad Presley, Luseland, Saskatchewan |
| 11,250 | Stephane Martel, Laval, Quebec |
| 5,680 | Kathy Rumpel, Arcadia, WI |
| 3,760 | Rick Beevers, Bloomfield, MN |
| 3,505 | Blake Cadmus, Reading, PA |

**FRACTION FEVER** *(Spinnaker)*

| | |
|---|---|
| 10,480 | ★Shawn Riggins, Orangevale, CA |

**GALACTIC ATTACK** *(Radio Shack)*

| | |
|---|---|
| 26,370 | ★Jeff Remick, Warren, MI |
| 10,600 | Brian Crabtree, College Park, WA |
| 9,930 | Daniel Streidt, Cairo, Egypt |

**GALACTIC FIGHTER** *(Four Star Software)*

| | |
|---|---|
| 153,725 | ★Michael Heitz, Chicago, IL |

**GALAGON** *(Spectral Associates)*

| | |
|---|---|
| 357,890 | ★Jason Clough, Houston, TX |
| 328,820 | Bernard Burke, Lee's Summit, MO |
| 249,960 | Matthew Fumich, Munford, TN |
| 169,410 | Danny Dunne, Pittsfield, NH |
| 149,520 | Vernon Johnson III, Parkville, MD |

**GALAX ATTACK** *(Spectral Associates)*

| | |
|---|---|
| 236,350 | ★Corey Leopold, Nada, TX |
| 28,300 | Augusto Voysest, Lima, Peru |

**GANTELET** *(Diecom Products)*

| | |
|---|---|
| 23,643,720 | ★Geran Stalker, Rivordalo, GA |
| 20,921,490 | Randall Edwards, Dunlap, KS |
| 10,222,940 | Clinton Morell, Sacramento, CA |
| 10,020,500 | Ken Hubbard, Madison, WI |
| 7,493,340 | Stirling Dell, Dundalk, Ontario |
| 2,626,950 | Jonathon Ross, Pocomoke City, MD |
| 2,512,620 | Jason Steele, Pensacola, FL |
| 2,312,640 | Rory Kostman, Hershey, NE |
| 2,115,790 | Jerry Honigman, Waggoner, IL |
| 2,011,200 | Jerry Colbert, Bakersfield, CA |
| 1,245,550 | Donald Cathcart, Halifax, Nova Scotia |
| 1,224,190 | Jonathan Wanagel, Freeville, NY |

**GHANA BWANA** *(Radio Shack)*

| | |
|---|---|
| 2,350,750 | ★Michael Heitz, Chicago, IL |
| 702,520 | Joseph Delaney, Augusta, GA |

**GIN CHAMPION** *(Radio Shack)*

| | |
|---|---|
| 1,074 | ★William Ehardt, Darien, IL |

**GROBOT** *(Children's Computer Workshop)*

| | |
|---|---|
| 8,090 | ★Curt Lebel, Louisville, KY |

**HALLOWEEN** (THE RAINBOW, 10/86)

| | |
|---|---|
| 625 | ★Clara Smith, Courtenay, British Columbia |

**HITCHHIKER'S GUIDE TO THE GALAXY** *(Infocom)*

| | |
|---|---|
| 400/422 | ★Jeff Holtham, Waterloo, Ontario |
| 400/510 | Brad Wilson, Lithia Springs, GA |

**INTERBANK INCIDENT** *(Radio Shack)*

| | |
|---|---|
| 4,861 | ★Shara and Chris Euton, Lilburn, GA |

**IRON FOREST** *(Diecom Products)*

| | |
|---|---|
| 1,013,100 | ★William Weller, Kailua, HI |

**JOKER POKER** (THE RAINBOW, 3/87)

| | |
|---|---|
| 2,793,285 | ★Blain Jamieson, Kingston, Ontario |
| 205,239 | Paul Dykes, Baton Rouge, LA |

# SCOREBOARD

13,377 Jason Ebbeling, Berkshire, MA
11,000 Frankie DiGiovanni, Olney, MD

**JUNIOR'S REVENGE** *(Computerware)*
2,503,000 ★Stephane Martel, Laval, Quebec
257,600 Keith Cohen, Rocky Mount, NC

**JUNKFOOD** (THE RAINBOW, 11/84)
25,670 ★John Guptill, Columbia, MO
18,650 Daniel Streidt, Cairo, Egypt

**KARATE** *(Diecom Products)*
31,000 ★Wayne Hufford, Kincardine, Ontario
11,600 Jonathon Ross, Pocomoke City, MD
6,300 David Darling, Longlac, Ontario

**THE KING** *(Tom Mix)*
3,824,280 ★Andre Grenier, Quebec, Canada
49,400 Benoit Landry, Drummondville, Quebec
22,400 Spencer Metcalf, Longview, TX

**KING TUT** *(Tom Mix)*
44,500 ★Curt Lebel, Louisville, KY

**KORONIS RIFT** *(Epyx)*
186,710 ★Tony Harbin, Cullman, AL
184,180 Russell Johnson, Sarnia, Ontario
184,120 John Farrar, Lebanon, TN
174,810 Donald Cathcart, Halifax, Nova Scotia
133,990 Paul Blessing, Spring, TX

**KUNG-FU DUDE** *(Sundog Systems)*
32,000 ★Tony Geitgey, University Park, PA

**LUNAR RESCUE** (THE RAINBOW 8/87)
260,427 ★Tom Beeker, Gracey, KY
246,668 Phillip Holsten, Modesto, CA
175,771 Jim Davis, Sandwich, IL
113,579 Jeff Remick, Warren, MI

**MAGIC OF ZANTH** *(Computerware)*
47 ★Robert Williams, Yellowknife, Northwest Territory

**MEGA-BUG** *(Radio Shack)*
9,016 ★Heather Richwalski, Medford, WI
5,172 Jason Ebbeling, Berkshire, MA

**MISSION: F-16 ASSAULT** *(Diecom Products)*
468,750 ★Karen Jessen, Cleveland, OH
355,570 Stirling Dell, Dundalk, Ontario
318,160 Jeremy Pruski, Sandwich, IL
144,510 Donald Cathcart, Halifax, Nova Scotia
137,920 Mike Grant, Fresno, CA

**MUNCHKIN BLASTER** (THE RAINBOW, 8/87)
11,950 ★Jim Davis, Sandwich, IL
10,420 Gabe Emerson, Baraboo, WI
9,760 Tom Beeker, Gracey, KY
9,080 John Weaver, Amsterdam, NY
9,000 Benoit Landry, Drummondville, Quebec

**ONE-ON-ONE** *(Radio Shack)*
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**SHOOTING GALLERY** *(Radio Shack)*
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**ZUES** *(Aardvark)*
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**— Jody Doyle**

# SCOREBOARD POINTERS

In conjunction with THE RAINBOW's Scoreboard, we offer this column of pointers for our game-playing readers' benefit. If you have some interesting hints, tips or responses to questions, or want help yourself, we encourage you to write to the Scoreboard, c/o THE RAINBOW.

### Feedback

In response to questions from:

- Curtis Schaaf, Eric Reitz and Matt Hoyer: In *Sands of Egypt*, the dates are in the tree. Feed the dates to the camel and ride to the scepter. The snake oil is to oil the scepter. Check the pyramid after you get the scepter.

- Patrick Slagle: In the *Interbank Incident*, the slot in the yacht is a tape player.

- Cory Harris: Get in the boat and give the monkey some tobacco in *Dallas Quest*.

- Thomas Crowe: In *Dallas Quest*, to pass the rat, get the sunglasses at the pool and give them to the owl. Go to the barn and drop the owl. Read the tombstone or get lost in the field.

- David Whyburd: In *Vortex Factor*, a clue to the combination to the safe is found in the office deck in London.

In *Dungeons of Daggorath*, how do I incant the wizard's supreme ring?

*David A. Ellis*
*Hopkinsville, KY*

- John Austin: In *Hitchhiker's Guide to the Galaxy*, when the bugblatter beast asks for your name, tell him Arthur Dent, then go east. Type `PUT TOWEL OVER MY EYES` and get the sharp stone. Carve "Arthur Dent" and remove the towel. Go west then southwest and get the interface. Wait until the beasthunters come.

- Marc Paulin: In *Dallas Quest*, to stop sinking, you should try giving the monkey some tobacco out of the pouch. He will then plug the hole with his tail.

- Ted Scarbrough: In *Sea Quest*, the piece you are missing is the ruby statue. It can be found by digging where the weather balloon is.

I found the anchor, pearl, silver and the statue. Where is the diamond ring?

*Chris Holcomb*
*Syracuse, NY*

- Paul King: In *Dallas Quest*, bribe the monkey with the tobacco to plug the hole. Then, just row with the shovel.

- Ric Yates: In *Dallas Quest*, get to the trading post and type `PULL CURTAIN`.

*Al Adams*
*Windsor, PA*

- Stevie Nakahara: In order to get the vector plotter in *Hitchhiker's Guide to the Galaxy*, turn the switch that is located in the Vogon Hold. You don't need the keyboard. Remember, take it easy and try to enjoy the Vogon poetry. In order to get past the screening door, you must show it tea and no tea at the same time.

In *The Magic of Zanth*, how do I get past the lake and how do I open the bottle?

*Jeff Holtham*
*Waterloo, Ontario*

- Graham Stinson: In *Sands of Egypt*, the axe can be found at the top of the pyramid. It is used to cut the palm fronds at the tree. In order to get to the tree, go to the pool and type `WALK TREE`.

How do you get into Krill's Lair in *Enchanter*?

*Joseph Delaney*
*Augusta, GA*

*Scoreboard:*

In *Dungeons of Daggorath*, try not to keep everything you find. It will weigh you down, make your heart speed up and make you faint more easily.

If you find an object and cannot reveal it, then stow it in your backpack and try to reveal it again after killing more creatures.

When using rings, be sure your heart is rested or the use of the ring may kill you.

Once you go down a level, don't go back up or the wizard will send stronger creatures to destroy you on that level.

Try to learn to recognize the sound of each monster; this will help you to get ready to fight them.

If you have a cassette player, try to save your place on the tape because it will save you a lot of time and is very handy.

*Brian Liguori*
*Bangor, PA*

*Scoreboard:*

In *Dungeons of Daggorath*, how do you incant the Supreme ring?

In *Pyramid*, how do you water the bean plant? When do you use `PLUGH`?

In *Raaka-Tu*, how can you find the gem? What do you do after you go down the secret passage and climb the hole?

*Stephane Martel*
*Laval, Quebec*

*Scoreboard:*

How do you defeat the wizard's image in *Dungeons of Daggorath*?

How do you get past the rug and the statue after it turns toward the west door in *Raaka-Tu*?

*Matthew Lohse*
*Camarillo, CA*

*Scoreboard:*

In *Hall of the King*, I cannot burn the fermenting grain and get to the hidden room. I have the match and the stick, but whenever I try to light it, the game says "You can't do that now!" What is the acid in the vial used for, and what is the purpose of the "still air" in the high priest's chamber?

*David Galloway*
*Phoenix, MD*

*Scoreboard:*

In *Sands of Egypt*, I'm in the outer chamber. I've translated the hieroglyphics but need specific instructions on what to do with the scepter. The hole in the roof just brings me back to the emptied pool.

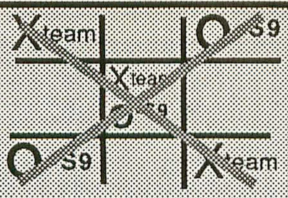
In *Dallas Quest*, I'm in Chugalug's Emporium and need to know where the flashlight is so I can light the basement.

*George Lane*
*Chicago, IL*

**To respond to other readers' inquiries and requests for assistance, reply to "Scoreboard Pointers," c/o THE RAINBOW, P.O. Box 385, Prospect, KY 40059. We will immediately forward your letter to the original respondent and, just as importantly, we'll share your reply with all "Scoreboard" readers in an upcoming issue.**

**For greater convenience, "Scoreboard Pointers" and requests for assistance may also be sent to us through the MAIL section of our Delphi CoCo SIG. From the CoCo SIG> prompt, pick MAIL, then type `SEND` and address to: `EDITORS`. Be sure to include your complete name and address.**

# XTEAM & OS-9



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*Do you still have your very first program?*

# Reliving Your First Keystrokes

**By Joseph Kolar**
**Rainbow Contributing Editor**

This month's tutorial is geared to you beginners who are struggling with the complexities of `PRINT`, `EDIT` and `SET` as you get on familiar terms with your new companion, the CoCo.

Whenever I capture a new convert to CoColand and plop him down in front of the virgin screen, he is taught to create a first program. This usually consists of name and address in three lines, tastefully centered on the Lo-Res text screen. The young student is invariably captivated by seeing his name and vital statistics portrayed on the screen. A copy of *My First Program* is saved for posterity.

The second lesson is an expansion of the first program, both to reinforce what was previously learned and to augment budding skills, and adds new personalized data such as birthday, age, school, parents' and friends' names, etc. The first thing you know, a personal database or file is created, a file that reflects items of interest to the student that he has committed to memory, allowing him to concentrate on hunting and pecking.

It is strongly recommended that the student have a copy of *My First Program*. Like a photo of oneself, taken in days long gone, running through the first programs can be a nostalgic and emotional experience.

What has this chatter got to do with you? Most demo programs the newcomer encounters in his march through a manual are wrung-out, barebones, uninspiring programs that ignore the student's desire to create something both personal and useful.

My object is to prepare a follow-up, second lesson that will both inform a student and sustain his interest. The program should be personalized and pleasing to the eye. Rather than blow my own horn and bore you stiff with the niceties of my lesson plan, let's pretend.

Let's pretend you are truly a newcomer and have plowed laboriously through the first lesson in your BASIC manual. Pretend you are in a classroom setting in a hands-on session at the CoCo. You are paying close attention to the instructor. I bet you will learn or recall some tidbits you may have forgotten.

"Turn on CoCo! Sssh! Program lines shall begin at 10 and move up by 10s. Line 0 will be reserved for whatever eight-character or less title you choose for the, as yet, unknown and unfinished graphic."

Entering `10 CLS` clears the screen and gives us a fresh drawing tablet. A `PRINT` will conveniently drop the cursor down one horizontal row. Type and enter the following:

```
20 PRINT
30 PRINT
```

Continue to create three more `PRINT` lines — 40, 50 and 60. Now run your program (by typing `RUN` and pressing ENTER). Not very impressive, but we have created five blank rows — no inconsiderable achievement.

To get CoCo to print something on the screen, the desired word or words must be enclosed within quote marks. To be printed, any combination of characters/spaces must be so enclosed.

Rekey Line 20 as `20 PRINT "DOCHITA"` and run. You will see `DOCHITA` printed on the top line with four innocuous blank lines followed by `OK` and the cursor ready for action on the sixth line, presently occupied by `OK`. This means that CoCo is announcing it has complied with your wishes. So far, so good! It is awaiting more instructions.

To put `DOCHITA` on Line 60 is no problem. Rekey Line 60, and note that the closing quote is often optional; if you omit it, CoCo assumes it knows your intentions. Try entering and running this:

```
50 PRINT"DOCHITA
```

You see, it prints with no difference. However, until you have progressed a lot further in your studies, add the closing quote wherever possible.

To add `DOCHITA` on the third line (and without dismantling the existing line), use the `EDIT` statement. Enter `EDIT40` and press X to jump to the end of the line. Type `"DOCHITA"` and press ENTER. This stuffs the word into CoCo's memory. Now run.

Whenever possible, use the `EDIT` statement rather than rekeying a program line. I advocate the use of `EDIT` as soon as the second lesson. When you begin to program, you will make plenty of mistakes that must be corrected. To me, `EDIT` is the eraser at the end of a pencil. Use it!

If you want to indent two spaces in Line 20, enter `EDIT20` and press the space bar until your cursor is over `D`. Pressing I (for *insert*) opens up the space between the opening quote and the first character, `D`. Press the space bar once for each desired space; in this instance, press the space bar twice and then press ENTER. CoCo inserts two spaces and closes up with the balance of the line. Run.

Line 30 will contain `DOCHITA` but take care of space by using `PRINTTAB(x)`. Enter `EDIT30` and press X to jump to the end of the line. Enter `TAB(0)`. CoCo will indent the desired number of spaces in the row designated by whatever value is currently between the parentheses. To indent two spaces, enter `EDIT30` and press the space bar until the cursor is over `0`. Type `C2` — CoCo is told to change (`C`) the character above the cursor to `2`. Press `SHIFT` and the up arrow to get out of the Change mode. Press ENTER, and then run.

On your own, add the missing `DOCHITA` on Line 50. Be sure to indent two spaces. Use the `PRINTTAB` statement.

Did you notice that Line 50 may have

---

*Florida-based Joseph Kolar is a veteran writer and programmer who specializes in introducing beginners to the powers of the Color Computer.*

been indented four spaces? This would occur if you used a `TAB` value of 2 and also left two blank spaces between the opening quote and the first character. The rule to follow whenever using `PRINTTAB` is to indent with the number value and begin the first character right after the opening quote. Run. Now use `EDIT` to indent Lines 40 and 60 to get a nice, straight column.

Enter `LIST` to take a look at our program listing. We want to delete `TAB(2)` from Lines 30 and 50. Enter `EDIT30` and press the space bar until the cursor is over the second `T`. Six characters (`TAB(2)`) are to be deleted. Type `6D` and press ENTER. Do the same for Line 50. Run the program and then list it. On your own, delete the two indenting spaces in the three remaining lines using `EDIT`.

Press CLEAR and run again. Five `DOCHITA`s are bunched up in the upper left-hand corner. What have we done? We have written a name to the screen on five successive lines. Enter `LIST` to see the program listing. If we wanted only blank rows, we could rekey the five `PRINT` lines. We could edit out the quotes and the enclosed name. But that is a lot of work. Let's do it the easy way!

Enter `DEL20-` and key in this line: `20 PRINT:PRINT:PRINT:PRINT:PRINT`. Run the program to see what our new line has done. Let's try it another way. Enter `DEL20` and replace our defunct line with a new Line 20: `20 FOR X=1 TO 5:PRINT:NEXT`. Run. The `X` is the number of rows involved. In this case, the first through fifth rows. At each row, CoCo prints a blank line (`PRINT:`) and goes on to the next `X` until all five `PRINT`s are executed.

If we want to use this loop to print a three-space indented `DOCHITA`, we enter `EDIT20` and press the space bar until the cursor is over the second colon. Press I, enter `"DOCHITA"` and run. If you forgot the closing quote, disaster strikes! Make this error to see what happens.

Note, also, that `:NEXT` is the proper format to agree with the `X` in the loop. In a single loop, with a `FOR-NEXT` item, CoCo is forgiving. It is best to use the variable indicator after `NEXT` because sometimes CoCo is very demanding and wants to know precisely which variable you are referring to.

From Line 20, edit out all instructions to CoCo to print `DOCHITA`. This includes the quotes. Enter `EDIT20` and press the space bar until the cursor is over the opening quote. Entering `12D` deletes both quotes, three spaces and seven letters. Run the program to see the difference.

Now that we know how to move text around the screen, we'll personalize the program. First, bear with me and use my example. I am using the name and address of a good colleague. Remember, if you use your name and address or that of a close associate, aside from yourself, the author, you will have an approving audience of one.

Line 30 will contain the centered name. Enter this line: `30 PRINTTAB(9)"DOCHITA D. MAY"` and run. We indicate a skipped line by using `PRINT`:

```
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS
AVE."
```

We add the town, etc., after an intervening blank line. This time we will use a multiple-line statement. We include both the empty row and the last line, separated by a colon:

```
60 PRINT:PRINTTAB(5)"
INVERNESS, FL., 32652"
```

**Check Account Information System**

If you have one or more checking accounts then you need CAIS. This is not just another checkbook program but an easy to use, menu driven, disk based information system for the CoCo 1, 2, 3.

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Reviewed in RAINBOW, February 1988.

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COMMANDS SUPPORTED:

1. I/O commands
CLOSE CLOADM CSAVEM DIR DRIVE DSKI$ DSKO$ FIELD
FILES GET INPUT KILL LSET OPEN PRINT PUT
RSET USING LINEINPUT
2. Program control commands
CALL DEFUSR END EXEC FOR NEXT GOSUB GOTO
IF THEN ELSE ERROR ON RETURN STOP USR
3. Functions
ABS ASC ATN COS CVN EOF EXP FIX
HPOINT INSTR INT LEN LOG LPEEK LOC LOF
PEEK POINT PPOINT RND SGN SIN SQR TAN
TIMER VAL VARPTR
4. String functions
CHR$ INKEY$ LEFT$ MID$ MKN$ RIGHT$ STR$ STRING$
5. Graphic/Screen commands
ATTR COLOR CLS CIRCLE DRAW HCOLOR HSCREEN HDRAW
HLINE HPAINT HPRINT HRESET HCIRCLE HCLS HSET JOYSTK
LINE LOCATE PALETTE PAINT PCLEAR PCLS PLAY PMODE
PRESET PSET RESET SCREEN SET SOUND WIDTH
6. Other commands
DATA DIM MOTOR POKE LPOKE RESTORE READ REM
TRON TROFF TAB VERIFY

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Notice that the three lines are neatly centered, both horizontally and vertically. There are five rows above the legend and six rows below. If you count all the rows, you will confirm there are 16 text lines available. If you begin at the left margin and watch the cursor as you space over to the right, you will count to 32, verifying that the text screen is 32-by-16.

At this point, substitute a name and address of your choice. Re-center it by changing values in each `TAB` line. Use a 6-inch ruler if you are in doubt about the centering. Remember, it need not be centered exactly, so long as it looks pleasing to you.

This program cries out for a border. In Lo-Res graphics, the screen's resolution is 64-by-32 and the color chosen will be orange, 8.

We begin by making a nice orange line across the top of the screen on the first, horizontal row. The leftmost space is designated as '0' and proceeds to the rightmost, 63rd, space. The vertical column ranges from 0 (at the top) down to 31.

To start our border, enter this line:

```
70 FOR H=0TO63:SET(H,0,8):
NEXTH
```

Compare this loop with the `PRINT` loop in Line 20. Instead of five blank rows, we are going to place (`SET`) a dab of orange color (8) in every column of the top row (Column 0), commencing with 0 through 63, horizontally. Run to see the top part of our border.

We will proceed clockwise. This means our next border segment will run down the right side of the screen.

On the last horizontal space, 63, beginning at the top, 0, we shall run down vertically and put a dab of orange in every space until we reach 31, the bottom right-hand corner. Enter this line:

```
80 FOR V=0TO31:SET(63,V,8):
NEXTV
```

Run the program. If the chewed-out space bugs you, enter `200 GOTO200` and run. This makes a never-ending loop, so the `OK` is never reached and displayed.

To do the bottom line of our border, we want to continue from right to left to maintain our clockwise direction. Enter this line:

```
90 FOR H=63TO0 STEP-1:SET(H,
31,8):NEXTH
```

Run. Going along the bottom, vertical column 31, we place our orange color in every horizontal location from 63, the rightmost spot, left until we reach 0. We indicate that we want every space filled in succession by telling CoCo `STEP-1`, which means to count backward by increments of 1.

This `STEP` part of the `FOR-NEXT` statement was not required in the ascending sequences. CoCo figures if you don't make your wishes known, it will default to `STEP+1` and assume that is your intention.

I think you can figure out the rationale for the fourth side — we'd like to move upward and end at the point of origin (H=0;V=0). Enter this line to finish the border and then run the program:

```
100 FOR V=31TO0 STEP-1:SET
(0,V,8):NEXTV
```

At this time, I prefer to give the program a name, hidden from view by a `REM` statement. Enter `0'TITLE`, substituting whatever name you want for the title. Using Line 0 for the title is a handy convention. Now save your program by whatever name you gave it in Line 0.

You can use any Lo-Res color you desire. Merely substitute the new color value for the third variable in each `SET` statement.

Which makes me note . . . four sides . . . four different colors. One solid color makes a neat border but you may want to experiment by changing colors in various combinations. Do so now. When finished, enter `NEW` and `CLOAD"TITLE"`, substituting your program name for `TITLE`. My idea is to use all eight colors in succession, one to a side, and see what it looks like.

Enter `EDIT70`, type `22` and press the space bar. This is an alternate method of moving around within a line. Pressing the space bar 100 times within Edit is not very efficient. Just use a likely number and press the space bar. If your guess was too low, keep tapping the space bar until you are over the target. If you overshot the landing field, use left arrow key to back up. Type C twice and press ENTER. Run the program.

This time we are going to change `8` to `C` and insert +1. To get where you want to go faster within Edit mode, enter `EDIT80`, type `23` and press the space bar. Press C twice, type `I+1` and then press ENTER. Run.

Let's edit Line 90 using our shortcut. Enter `EDIT90`, type `33` and press the space bar (this moves you 33 spaces within the line, remember?). Press the left arrow key three times, press C twice and I once, then type +2, press ENTER, and run.

On your own, change the color in Line 100 to `C+3`, and run. It is not quite right, but we are not finished. To move this border through the range of colors from 1 to 8 (not 0 to 8), we have to enclose lines 70 through 100 in a nested loop. Enter `LIST` and examine the listing.

Can you see why we left all that space between line numbers? There is plenty of room to insert bits and pieces of our program without the annoyance of renumbering lines and throwing our minds into turmoil as we adjust to remembering a new set of line numbers. Enter these lines:

```
65 FOR C=1 TO 8
110 NEXTC
```

Run the program and you'll see it goes along nicely, but runs out of steam when we get an FC Error in Line 100. Enter `LIST` to search for the problem. Ah, when `C` became 6, `C+3`=9, a no-no. The solution is to explain what is what to CoCo (somewhere within the outer loop). When `C` gets unruly and out of range, it should shape up and get back to the first color (green) and Go! Go! Go!

A good place is just before Line 70. Enter this line:

```
66 IF C+3=9 THEN C=1
```

Run. This would be a good time to save this version. Give it a title (`0'CLRTITLE`) and save it by that title.

Suppose I used `IF C=9 THEN C=1`? Would it work? Further, why didn't I use `FOR C=0 TO 8`? This is really splitting hairs.

Take time out for a breather. When renewed, revise the program to run in a counterclockwise direction.

Enter `NEW` to start from scratch, and load CLRTITLE (`LOAD"CLRTITLE"` or `CLOAD"CLRTITLE"`). Let's see how it looks if we skip every second space.

Enter `EDIT70` and press the space bar until the cursor is over the first colon, press I, type `STEP+2` or `STEP2` and press ENTER.

Ditto for Line 80.

For Line 90, enter `EDIT90` and press the space bar until the cursor is over the `1` of `-1`, press C and enter `2`. Ditto for Line 100. Run.

Not bad! It looks like a movie marquee. Change Line 0 and save the program as `MARQUEE`.

What is wrong with all four sides in one color, which is perpetually changing? Try this: Enter `EDIT66` and press the space bar until the cursor is over the 3, press C, type `1` and press ENTER. Enter `EDIT80`, press X to jump to the end of the line, press the left arrow key to chop off the +, and enter `):NEXTV`.

Ditto for Line 90, `C+2` to `C`.

Edit these lines whichever way you please. I prefer to use X, backspace and make my adjustment. Another way is to enter `EDIT90` and press the space bar until the cursor is over the +, press H and enter `(:NEXTH`.

Now, in Line 100, change `C+3` to `C`. You know how!

To make the color change occur in the lower-left corner, edit Line 100 to `C+1`.

I like the last way better because your eye wanders to the upper-left corner where you expect the color change to occur. Save your revision as `MARQUEE` after you change Line 0.

We haven't exhausted the possibilities. Mask lines 80 and 100. This eliminates the vertical sides. Run.

Now edit Line 70 to `STEP+1` and Line 90 to `STEP-1`, and run again.

Just for kicks, let's advance the `STEP+3` in Line 70 and `STEP-3` in Line 90 and run.

This is getting out of hand. Unmask Lines 80 and 100 and run. This is an odd combo of plus and minus `STEP`s 2 and 3. We might as well see what the whole thing looks line in `STEP` plus and minus 3.

Edit lines 80 and 100. By mistake, I changed lines 80 and 100 to `STEP +1` and -1, respectively. That looks fine!

Save whatever catches your eye. There are other combos to investigate. What do you say to a two-color, flashing screen? Enter these lines:

```
67 SCREEN0,1
105 SCREEN0,0
```

Now run. Talk about googly-eyed! Try these:

```
75 SCREEN0,0
85 SCREEN0,1
95 SCREEN0,0:
105 SCREEN0,1
```

Run, and delete Line 85. Care to save anything?

. . . And so it goes! Have you noticed every time we attempt some new variation, our effort is rewarded by suggesting some new experiment? The only thing to stop us is exhaustion or getting bleary-eyed from the constant blinking and rotational motion.

Imagine what we turned up when we lifted the rock of ignorance from the nest of such BASIC concepts. We are scratching around in the most rudimentary BASIC program areas and looking at the wealth of goodies we uncovered. At the rate we are going, we have enough material to be mired down investigating various aspects of Lo-Res graphics that we may never graduate to ponder the wonders of CoCo 3's Super Extended BASIC.

By the same token, we will never tire of our romp through BASIC and Extended BASIC with CoCos 1 and 2.

If you are a newcomer to CoColand, you have just taken a giant step on your way to computer literacy . . . or should I say, artistry? Now, get back to your CoCo and kick over a few more rocks that we left undisturbed, and experiment with more variations on our simple, but fun, theme. ☐

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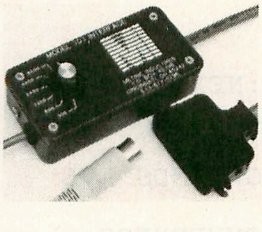

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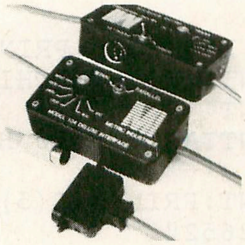

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- Comes complete with cables to connect to your computer and printer

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- Connect to your COCO serial port and have 3 switch selectable serial ports
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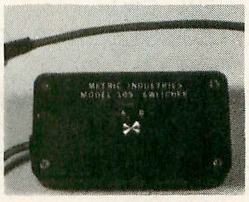

- Connects to your COCO to give you 2 switch selectable serial ports
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The Model 101, 102, 104 and 105 work with any COCO, any level basic and any memory size. These products are covered by a **1 year warranty.**

The Model 101 and 104 work with any standard parallel input printer including Gemini, Epson, Radio Shack, Okidata, C. Ioth, Seikosha, Panasonic and many others. They support BASIC print commands, word processors and graphic commands.

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**Listing 1:**

```
0 '<TITLE>
10 CLS
20 FOR X=1 TO 5:PRINT:NEXTX
30 PRINTTAB(9)"DOCHITA D. MAY"
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS AVE
."
60 PRINT:PRINTTAB(5)"INVERNESS,
FL., 32652"
70 FOR H=0 TO 63:SET(H,0,8):NEXT
H
80 FOR V=0 TO 31:SET(63,V,8):NEX
TV
90 FOR H=63 TO 0 STEP-1:SET(H,31
,8):NEXTH
100 FOR V=31 TO 0 STEP-1:SET(0,V
,8):NEXTV
200 GOTO200
```

**Listing 2:**

```
0 '<CLRTITLE>
10 CLS
20 FOR X=1 TO 5:PRINT:NEXTX
30 PRINTTAB(9)"DOCHITA D. MAY"
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS AVE
."
60 PRINT:PRINTTAB(5)"INVERNESS,
FL., 32652"
65 FOR C=1 TO 8
66 IF C+3=9 THEN C=1
70 FOR H=0 TO 63:SET(H,0,C):NEXT
H
80 FOR V=0 TO 31:SET(63,V,C+1):N
EXTV
90 FOR H=63 TO 0 STEP-1:SET(H,31
,C+2):NEXTH
100 FOR V=31 TO 0 STEP-1:SET(0,V
,C+3):NEXTV
110 NEXTC
200 GOTO200
```

**Listing 3:**

```
0 '<MARQUEE>
10 CLS
20 FOR X=1 TO 5:PRINT:NEXTX
30 PRINTTAB(9)"DOCHITA D. MAY"
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS AVE
."
60 PRINT:PRINTTAB(5)"INVERNESS,
FL., 32652"
65 FOR C=1 TO 8
66 IF C+3=9 THEN C=1
70 FOR H=0 TO 63STEP2:SET(H,0,C)
:NEXTH
80 FOR V=0 TO 31STEP+2:SET(63,V,
C+1):NEXTV
90 FOR H=63 TO 0 STEP-2:SET(H,31
,C+2):NEXTH
100 FOR V=31 TO 0 STEP-2:SET(0,V
,C+3):NEXTV
110 NEXTC
200 GOTO200
```

**Listing 4:**

```
0 '<MARQUEE1>
10 CLS
20 FOR X=1 TO 5:PRINT:NEXTX
30 PRINTTAB(9)"DOCHITA D. MAY"
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS AVE
."
60 PRINT:PRINTTAB(5)"INVERNESS,
FL., 32652"
65 FOR C=1 TO 8
66 IF C+1=9 THEN C=1
70 FOR H=0 TO 63STEP2:SET(H,0,C)
:NEXTH
80 FOR V=0 TO 31STEP+2:SET(63,V,
C):NEXTV
90 FOR H=63 TO 0 STEP-2:SET(H,31
,C):NEXTH
100 FOR V=31 TO 0 STEP-2:SET(0,V
,C+1):NEXTV
110 NEXTC
200 GOTO200
```

**Listing 5:**

```
0 '<BONUS>
10 CLS
20 FOR X=1 TO 5:PRINT:NEXTX
30 PRINTTAB(9)"DOCHITA D. MAY"
40 PRINT
50 PRINTTAB(7)"510 HIGHLANDS AVE
."
60 PRINT:PRINTTAB(5)"INVERNESS,
FL., 32652"
65 FOR C=1 TO 8
66 IF C+1=9 THEN C=1
67 SCREEN0,1
70 FOR H=0 TO 63STEP3:SET(H,0,C)
:NEXTH
75 SCREEN0,0
80 FOR V=0 TO 31STEP+1:SET(63,V,
C):NEXTV
90 FOR H=63 TO 0 STEP-3:SET(H,31
,C):NEXTH
95 SCREEN0,0
100 FOR V=31 TO 0 STEP-1:SET(0,V
,C+1):NEXTV
105 SCREEN0,1
110 NEXTC
200 GOTO200
```

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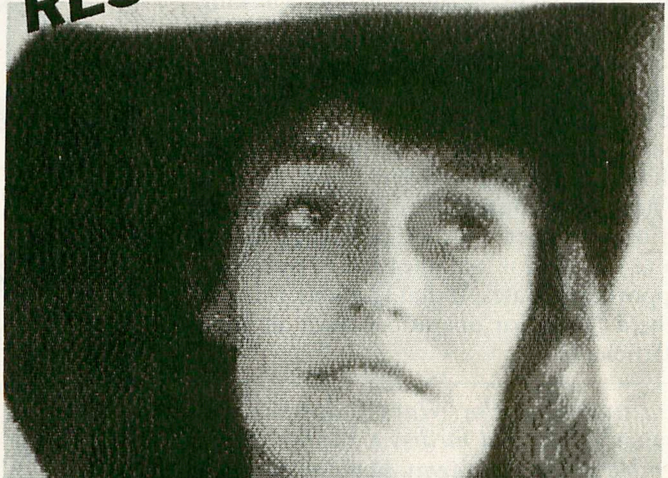

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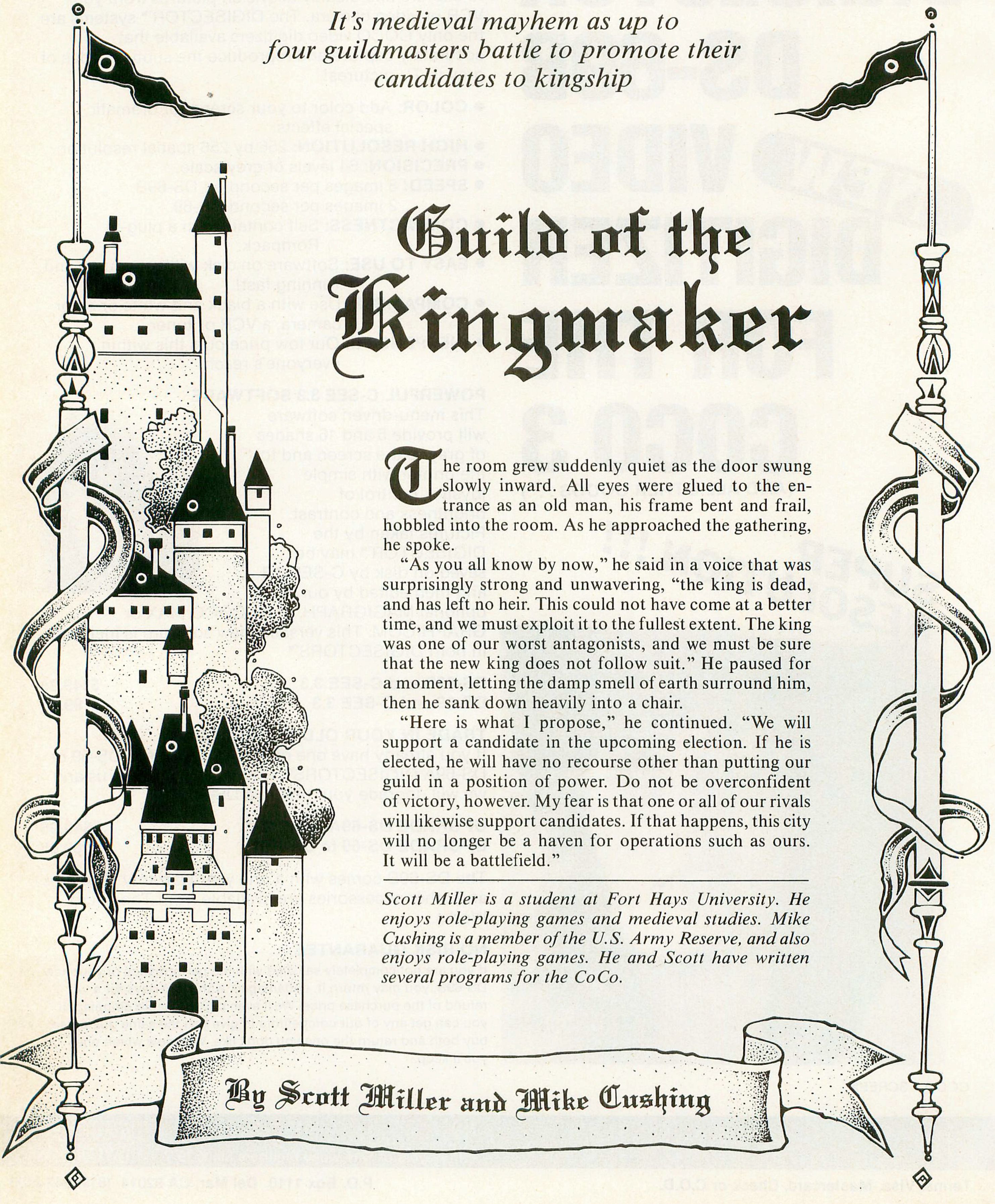
*It's medieval mayhem as up to four guildmasters battle to promote their candidates to kingship*

# Guild of the Kingmaker



The room grew suddenly quiet as the door swung slowly inward. All eyes were glued to the entrance as an old man, his frame bent and frail, hobbled into the room. As he approached the gathering, he spoke.

"As you all know by now," he said in a voice that was surprisingly strong and unwavering, "the king is dead, and has left no heir. This could not have come at a better time, and we must exploit it to the fullest extent. The king was one of our worst antagonists, and we must be sure that the new king does not follow suit." He paused for a moment, letting the damp smell of earth surround him, then he sank down heavily into a chair.

"Here is what I propose," he continued. "We will support a candidate in the upcoming election. If he is elected, he will have no recourse other than putting our guild in a position of power. Do not be overconfident of victory, however. My fear is that one or all of our rivals will likewise support candidates. If that happens, this city will no longer be a haven for operations such as ours. It will be a battlefield."

---

*Scott Miller is a student at Fort Hays University. He enjoys role-playing games and medieval studies. Mike Cushing is a member of the U.S. Army Reserve, and also enjoys role-playing games. He and Scott have written several programs for the CoCo.*

By Scott Miller and Mike Cushing

*To Be King* is a Simulation that allows two to four players to take on the role of a guildmaster who wants his candidate to be the next king. A 128K CoCo 3 is required to run *To Be King* as written; however, the program will also run on a 64K CoCo 1 or 2 if the title screen in Listing 1 (lines 10 through 80 and Line 99) and Line 120 of Listing 2 are omitted.

In order to run the programs, type in both listings, one at a time, and save them under the names `KINGBOOT.BAS` and `KING.BAS`. Do not write protect the disk, as a data file is written in the `KINGBOOT` program. When you play *To Be King*, always begin with a cold start, because most of BASIC's available memory is used by the programs.

### The Ultimate Managerial Resource

Running a guild is hard work, but all guildmasters have a magical box from the far future known as a CoCo. This is a wonderful item indeed, for it allows actions to be performed instantaneously, with the results being known almost immediately. There are seven main functions that can be performed by this tool of potent enchantment, as shown on the main menu.

### A View to a Kill

First, you have the ability to hire and dispatch thieves and assassins. Assassins are used to eliminate rival candidates and to close businesses that are allied with rival guilds. Spies are used to determine the relative strengths and weaknesses of the opposition, as well as to scout possible targets for your guild to take over.

When a player chooses Option 1, he may hire spies, assassins, or both. Spies and assassins send contacts to each guild only once per turn, so if a guildmaster wants to hire assassins, for example, he needs to hire these assassins all at once. Any further contact for that week will be avoided as it poses an unnecessary risk. A third choice under Option 1 (which is also included in most other options) is that of listing the 144 businesses that are currently in the city.

### Horse Trading

The second choice on the main menu is negotiation. Negotiation is the primary way to gain constant income for a guild. The first choice on the negotiation menu is to form an alliance with a neutral business. This action requires an amount of gold that you specify and the efforts of two of your guildsmen.

**Table 1: Chart of Commands**

- I. Hire Spies and Assassins
  - A. Hire Assassins
  - B. Hire Spies
  - C. Main Menu
- II. Negotiate
  - A. Form an Alliance
  - B. Invest in Allies
  - C. List Businesses
  - D. Main Menu
- III. Protection
  - A. Assign Guards to Candidate
  - B. Assign Guards to Business
  - C. Hide Candidate
  - D. Magically Hide Candidate
  - E. Main Menu
- IV. Discredit
  - A. Magically Discredit
  - B. Spread Rumors
  - C. Blackmail
  - D. Main Menu
- V. Raise Funds
  - A. Beg From Wizard
  - B. Steal
    - 1. From Guild
    - 2. From Business
    - 3. From The Wizard
  - C. Main Menu
- VI. Armed Conflict
  - A. Recruit Locals
  - B. Hire Mercenaries
  - C. Train Locals
  - D. Ambush a Guild
  - E. Ambush a Business
  - F. Main Menu
- VII. Status
  - A. Main Menu
  - B. End Turn

**Table 2: Investment Costs**

| | |
|---|---|
| Moneylender: | 2,000 |
| Inns & Taverns: | 2,600 |
| Craftsmen: | 280 |
| Farmers: | 200 |
| Livestock traders: | 2,100 |

If the negotiations prove successful, the guild will gain a variable amount of income dependent on the type of business that is being courted.

A guild may also invest in allied businesses. This action requires a set amount of gold (see Table 2) and, although expensive, generally increases the income from that business by a large extent. Any number of negotiations and investments may be done in a turn, subject to available manpower and gold, of course.

### Self-Protection

The third set of actions available are those that allow protection of candidates or allied businesses. Either may be protected with any or all men you have at your disposal. Protection helps guard both against assassination of candidates or business owners to prevent a loss of income, and it also works well against overt assault.

Candidates may also be hidden at a cost of 200 gold pieces. Hidden candidates may not be guarded by guild members, but they have 20 guards protecting them who are loyal supporters, but not guild members. Thus, no men are required for this action.

The last option a guild may use to protect a candidate is to hire the wizard to magically protect him. Only guilds that are allied with the wizard may use this function. Magical protection costs 1,000 gold pieces and provides the candidate with a horde of fearsome creations that function as his bodyguards while he is hiding. Both forms of hiding must be renewed for every turn.

### Mud Slinging

Another way to impede the flow of coins into rival guilds' coffers is to discredit their allies, which is the fourth option on the main menu. If the wizard is currently allied with a guild, then that guild may magically discredit an enemy business. This action costs 100 gold pieces and eliminates income from the target business for that week.

The same effect can be garnered in a more general fashion by hiring rumor-mongers to discredit a guild. These rumor-mongers cost 25 gold pieces to hire for one turn. They have the effect of taking away from one to 50 gold pieces of a rival guild's income. Note that you could possibly lose money by plying this tactic.

The final option to discredit a guild is quite different — blackmail. Blackmail costs 150 gold pieces per target and, if successful, the target will end any alliances it may have, making it neutral once more. This action may be particularly useful against businesses that are invested in, as opposed to merely allied with.

### Beg, Borrow or Steal

The fifth option available to the guild masters is to raise funds. The first method of doing this is to ask for a contribution from the wizard, who is notoriously fickle and prone to drastic mood swings.

A guild need not be allied with the wizard to gain money in this manner, but it does help. It is always best to ask for very small *quantities* of money, and it is inadvisable to ask more than once per turn. When the wizard feels that a guild is being overly greedy, he has been known to destroy businesses allied with that guild. Only those in dire straits should ever ask for such a contribution.

The other way to gain money is to send some of your men to steal from a rival guild, business or the wizard. A guildmaster may steal as many times per turn as he wants, subject to the amount of men available. The guildmaster determines how many men to send on each mission. Note that stealing is an all-or-nothing proposition. The penalty for failure is the death of the thieves.

**On to Battle**

The sixth option on CoCo's magic menu is armed conflict. This option allows the training and recruiting of more guildmembers, which will allow you to ambush rival guilds in order to kill their candidate, and to destroy their businesses and thus remove a source of income. Local people can be recruited to join the guild, but they are considered untrained, and the guild must pay the cost of the training.

Recruitment of locals requires two guild members and an amount of gold the guildmaster specifies. Training requires no guild members, but does require an amount of gold. An alternative to such recruiting is to hire mercenaries at the rate of 100 gold pieces each. It takes one guild member to hire mercenaries, who are already fully trained when hired.

Other options under this menu involve overt armed actions. These functions are similar to the sending of assassins in regard to the effects of success. It is important to note that attackers are at a disadvantage, and even if they face no guards from a rival guild, they run the risk of death at the hands of normal citizens and traps meant to dissuade such activities.

**Statement of Conditions**

The last option on the main menu is the status report, which shows how much gold a guild's treasury contains as well as current income and income for the previous turns. It also lists how many untrained recruits are awaiting training, how many guildmembers currently exist, and how many are available for action on the current turn.

The second page of the report lists the businesses that are allies as well as those that the guild invests in. This screen also contains the method for ending a guild's turn and going on to the next guildmaster's actions.

**Order of Play**

When KINGBOOT is run, it asks how many guilds there will be in the game, how many weeks (turns) the game is to last, and what the names of the guilds are. It will then generate a data file called KING.DAT and run KING.

Each player starts the game with 1,000 gold pieces, no income, and 10 guild members. Before each player's turn, he will be asked how much he wants to bid on the wizard's services for the next turn. The high bidder can then use any magical commands for the next turn.

The game continues until there is either one candidate left or until the specified amount of weeks is concluded. If time runs out, the computer selects a winner using several criteria. If the same players want to play again, the computer will start the Simulation using the same parameters as were specified in KINGBOOT. If the players elect not to play again, the computer will return to BASIC with a cold start. The game may be ended at any time by pressing the BREAK key.

**Hints**

The best way to win at *To Be King* is to develop a strategy that extends a few turns into the future. It may appear to some people that emphasis in only one or two areas is good, but if an opponent finds a weakness, the game might soon be over! It may be a good idea to have all of the players agree not to use assassins for the first two or three turns, as a lucky break could remove candidates before they could even build a power base. Above all, never leave a candidate totally unprotected, and try to quickly gain a sizable income.

---

*(Questions or comments may be directed to the authors at 210 W. 15th, Hays, KS 67601. Please enclose an SASE when writing for a reply.)* ☐

| | |
|---|---|
| 80 | 181 |
| 161 | 177 |
| 183 | 173 |
| 202 | 14 |
| END | 118 |

**Listing 1:** KINGBOOT

```
0 PCLEAR 1
5 CLS
6 X=RND(-TIMER)
10 HSCREEN 1
15 HCLS0:PALETTE 0,0:PALETTE 1,0
20 HDRAW"BM10,10S8BR3BDG3ERE2NR5
DR6DR3NEGL2HLG3RND3ED3G2UH3NRNE3
D2RDRDF2NU2R5NE3UL4BR10BU11BR4BD
G4ND3RD4ED2ED2FNU7NR5ER5E3NU3LU4
GU2GU2NGNL3HL2G3NGRD4"
30 HDRAW"S8BD10BL3BR3BDNG3R5GL4N
GR4G4NUFDLDBU8BR8ND2FDG5U3NE3LD4
GL3NG2R2DRNR2DR4E3UGUGBR5BU9BR3B
DG3ERE2R4GNL3G4ND2RNDBR2NRE5D2ED
NRD2NE3G2NR3L4D2NEDR3D2R2ENEL6HL
2G2"
40 HDRAW"S8BD8BR3BDG3ERE2NR4DR3G
4NRNFD2BD2LNG2R3GNR3FR3LH2ENU3EU
3E4D2EDR2NEL2BD2L3NGR3DLG2FRD3E2
HDBR5BU10BR3BDG3ERE2NR4DR3G3LGLN
GR3DL2FBD2LNG2R2DFU2RU4RND2UE4"
50 HDRAW"S8BR2BU1BR2BDG2ER3NHGD7
LNG2R2GR3GNLBR4HUH2UHUH2RF2DFDF2
DFU11NRGR3GR3NEGLBR4BU4BR4BDG4ND
3RD4F3R5E3U2LND2L4NLE4NEL3NDNFLN
EU2G4RND6ED4GD2R5"
60 HDRAW "BR7DR2DBR2BU2DR2DBR2BU
2DR2D"
70 HPRINT(16,19),"(C) 1988":HPRI
NT(14,20),"S&M Software"
80 PALETTE 1,64:PALETTE 12,64:PA
LETTE 13,0
90 I$=INKEY$:IF I$="" THEN 90
95 CLEAR 5000
```

```
97 DIM ML$(6),IN$(20),CM$(50),FM
$(60),LT$(8),BT(200),BS(200),BG(
200)
99 HSCREEN 0
100 INPUT"HOW MANY PLAYERS (2-4)
";NP:IF NP<2 OR NP>4 THEN CLS:GO
TO 100
110 CLS:FOR X=1 TO NP:PRINT"WHAT
 IS THE GUILD NAME FOR      PLAY
ER"X"?":INPUT GN$(X):GP(X)=1000:
AF(X)=10:GG(X)=10:NEXT X
120 INPUT"HOW MANY WEEKS UNTIL T
HE NEW   KING IS ELECTED";W
140 FOR X=1 TO 6:READ ML$(X):NEX
T X
141 DATA GUIDO'S MONEY HOUSE, TH
E KING'S ENVY,SHARKEY'S LOAN EMP
ORIUM,ALPHONSE'S FAMILY,HAPPY ED
DIE'S FINANCING,THE GOLD EXCHANG
E
160 FOR X=1 TO 20:READ IN$(X):NE
XT X
161 DATA THE ALE HOUSE, DRINKS A
ROUND, THE BATTERED MACE, THE MI
NSTREL, EHD'S PLACE,HARNEY'S LIQ
UORS, PEACEFUL REST INN, THE DRA
GON'S DEN, THE IMPERIAL HOSTEL,T
HE BLUE HERRING INN
162 DATA THE ELFIN DAMSEL,THE BL
ACK ORCHID,THE ADVENTURERS GUILD
,THE CROSSED SWORDS INN, BLOODHA
WK TAVERN, THE GOLDEN UNICORN, K
ING'S CASTLE,THE LOQUACIOUS BARD
,ALL THE KING'S MEN,ELYSIUM ON E
ARTH
180 FOR X=1 TO 50:READ CM$(X):NE
XT X
181 DATA SENSUOUS SILKS,MARKAN C
LOTHES,CLAY CREATIONS,GOLDEN TIM
BRE MUSIC, SEA WORTHY SHIPPING,F
ROW'S SMITHY,BANNERS FOR PROCLAM
ATION,FLASKS BOTTLES AND JARS,LO
WAN'S CABINETS,FINE PARCHMENTS A
ND INK
182 DATA SWEETS AND CONFECTIONS,
DEWQUAS' BARBERY,GLIMMER OF GOLD
,THE GOOD BAKER,SUITS AND CLOAKS
,PLEASURE OF PLATINUM,BRITE SKEI
N WEAVERY,DELGAR THE ARMORER,SAM
'S CHANDLERY,WOVEN DREAM CARPETS
183 DATA PERFECT ESSENCE, THE MI
NERAL BATHS,MACWEN'S LEATHER SHO
P,BROKEN HEEL COBBLER,LEXIS' SCR
IPT,LOKAN THE FLETCHER, BARREL M
AKERS' GUILD,TITAN LUMBER COMPAN
Y,SAVAR THE PHYSICIAN,SARL'S MOR
TUARY
184 DATA SORAHAN'S COLORS,RARE S
PICE,CLASH OF STEEL,SIGNOR'S STU
DIO,THE GRANITE MINER,HELKEN'S F
INE WEAPONRY,ETCHED PANES,MOLTEN
WAX,WOOLEN WONDERS,TRUSTY'S SMI
THY
185 DATA LIQUID CURES ALCHEMY,BU
TCHER'S BLEND,GLAZED POTTERY,GER
WEK'S PAWN SHOP,QUESTEN THE SHAR
PENER,TAROT REVEALED,ADDER'S STI
NG POISONS,BESVAN'S CUTLERY,FOR
LADIES ONLY,YE OLDE TOY SHOP
200 FOR X=1 TO 60:READ FM$(X):NE
XT X
201 DATA MILLER, CUSHING, FIELDS
, BARNETT, HARTMAN, LINDEN, HERL
, ROHLEDER, BROOKS, LUEHRS, KLEI
N, LEE, SMITH, JONES, BROWN, WHI
TE, MINOR, WOLF, CASEY, VILLINES
202 DATA ETHAM, STORM, STACEY, H
AGEN, CULVER, MC FLY, WEIS, KASS
ON, DINKEL, LAMB, BERRYMAN, MEAD
E, WITT, FABER, CAMPBELL, HORN,
VINCENT, BREWSTER, DILLON, HEIL
203 DATA FURMANSKI, BARBOUR, MAR
SHALL, SCHUSTER, LUCAS, BIRD, WI
LSON, SLOOP, DOAN, GRAFF, STURGE
ON, THISSEN, ANDERSON, BACH, BOO
R, PAGE, NEWTON, SOOK, LEIKER, B
REIT
220 FOR X=1 TO 8:READ LT$(X):NEX
T X
221 DATA ARABIAN KNIGHTS HORSES,
```

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| | |
|---|---|
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```
JUSAN'S CATTLE PENS,THE GOAT HER
D,THE KING'S MOUNT,THE SHEEP AUC
TION,KEB'S STOCKYARD,YEWLON'S AN
IMALS,THE MULE BARN
222 OPEN"O",#1,"KING.DAT"
223 WRITE #1,NP,W:FOR X=1 TO 6:W
RITE #1,ML$(X):NEXT X:FOR X=1 TO
 20:WRITE #1,IN$(X):NEXTX:FOR X=
1TO50:WRITE #1,CM$(X):NEXTX:FORX
=1TO60:WRITE #1,FM$(X):NEXTX:FOR
X=1TO8:WRITE #1,LT$(X):NEXTX:FOR
 X=1TO4:WRITE #1,GG(X),GP(X),GN$
(X),AF(X):NEXTX
224 CLOSE #1:CLS::RUN"KING"
```

| | | | | | |
|---|---|---|---|---|---|
| 100 | 45 | 810 | 147 | 1465 | 133 |
| 250 | 69 | 890 | 103 | 1520 | 37 |
| 340 | 33 | 950 | 36 | 1660 | 80 |
| 400 | 174 | 1060 | 113 | 1800 | 25 |
| 490 | 76 | 1160 | 20 | 1940 | 217 |
| 570 | 160 | 1230 | 12 | 2040 | 217 |
| 630 | 181 | 1330 | 68 | 2140 | 12 |
| 730 | 97 | 1410 | 230 | END | 232 |

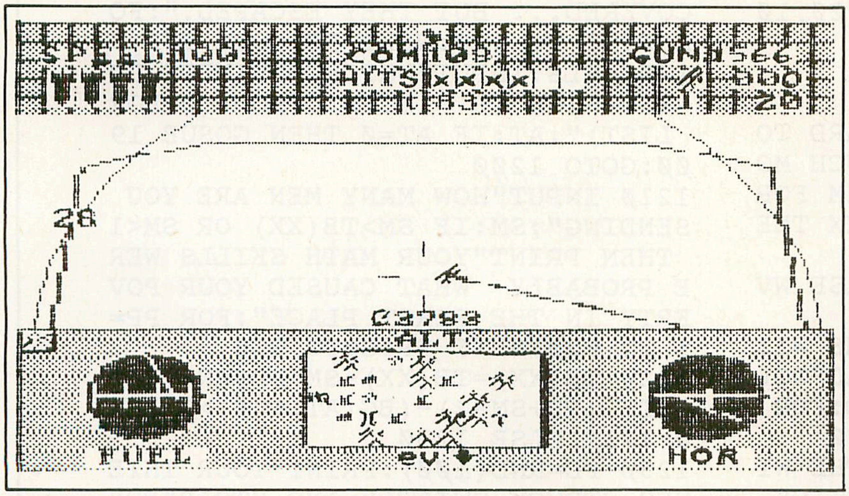
**Listing 2:** KING

```
0 PCLEAR 1
10 CLEAR 2000:ZZ=0:XX=0
20 DIM ML$(6),IN$(20),CM$(50),FM
$(60),LT$(8),BT(144),BS(144),BG(
144),QD(144),ZX(144)
25 FOR X=1 TO 4:FQ(X)=0:NEXTX
30 OPEN"I",#1,"KING.DAT"
40 INPUT #1,NP,W:FOR X=1TO6:INPU
T #1,ML$(X):NEXT X:FOR X=1TO20:I
NPUT #1,IN$(X):NEXT X:FOR X=1TO5
0:INPUT #1,CM$(X):NEXT X:FOR X=1
TO60:INPUT #1,FM$(X):NEXT X:FOR
X=1TO8:INPUT #1,LT$(X):NEXT X:FO
R X=1TO4:INPUT #1,GG(X),GP(X),GN
$(X),AF(X):NEXT X
45 CLOSE #1
50 ZZ=ZZ+1:XX=0:IF ZZ>W OR DB+1=
NP THEN 170
60 XX=XX+1:GG(XX)=0:WV=0:AF=0:MH
=0:SF=0:GOSUB 1750:WD=0:IF GS(XX
)=1 AND DF(XX)=0 THEN 180 ELSE I
F GS(XX)=1 THEN 160
70 CLS
80 PRINT"WHAT NEXT GUILDMASTER?"
90 IF FQ(XX)=0 THEN GG(XX)=0:AF(
XX)=10:SF(XX)=0:MH=0:FQ(XX)=1
100 PRINT"1. HIRE ASSASSINS OR S
PYS":PRINT"2. NEGOTIATE":PRINT"3
. PROTECT CANDIDATE OR ALLIES":P
RINT"4. DISCREDIT OTHER CANDIDAT
ES":PRINT"5. RAISE FUNDS":PRINT"
6. ARMED CONFLICT":PRINT"7. STAT
US"
110 I$=INKEY$:IF I$="" THEN 110
120 ON BRK GOTO 2130:ON ERR GOTO
 2210
130 I=VAL(I$)
140 ON I GOSUB 200,490,650,830,9
70,1350,1660
150 GOTO 70
160 GOSUB 1885:IF XX<NP THEN 60
ELSE 50
170 GOTO 1530
180 DB=DB+1:PRINT"YOUR CANDIDATE
 IS DEAD ... YOU LOSE... YOU BE
TTER START PRAYING FOR THE KING'
S MERCY!!!"
190 I$=INKEY$:IF I$="" THEN 190
ELSE DF(XX)=1:GOTO 160
200 CLS:PRINT"HIRE ASSASSINS OR
SPYS."
210 PRINT"1. HIRE ASSASSIN":PRIN
T"2. HIRE SPYS":PRINT"3. MAIN ME
NU"
220 I$=INKEY$:IF I$="" THEN 220
230 I=VAL(I$)
240 ON I GOTO 260,360,250
250 RETURN
260 CLS:PRINT"HIRE ASSASSINS.":I
NPUT"HOW MANY DO YOU WISH TO HIR
E";NA:IF AF=1 THEN PRINT"YOU ALR
EADY HAD YOUR CHANCE.":FOR PP=1
TO 920:NEXT PP:GOTO 200 ELSE 270
270 CO=NA*(100+RND(100)):AF=1:PR
INTNA"ASSASSINS COST"CO:FOR PP=1
 TO 920:NEXTPP:GP(XX)=GP(XX)-CO:
IF GP(XX)<0 THEN PRINT"WE DON'T
DO CHARITY.":GP(XX)=GP(XX)+CO:FO
R PP=1 TO 920:NEXT PP:GOTO 200 E
LSE 280
280 IF X=0 THEN 200 ELSE FOR X=1
 TO NA
285 CLS:PRINT"SEND ASSASSIN"X"TO
--"
290 PRINT"1. CANDIDATE":PRINT"2.
 BUSINESS":PRINT"3. LIST BUSINES
SES"
300 I$=INKEY$:IF I$="" THEN 300
310 I=VAL(I$):ON I GOTO 320,340,
335
320 INPUT"WHICH CANDIDATE";AT:PD
=RND(100):IF PD<3 OR PD<=20-GG(A
T) THEN PRINT"SUCCESS!!! CANDIDA
TE "AT" IS     DEAD!!!":GS(AT)=1:
FOR PP=1 TO 920:NEXT PP:NEXT X:G
OTO 200
330 PRINT"YOUR ASSASSIN FAILS IN
 HIS      MISSION.":FOR PP=1 TO
920:NEXT PP:NEXT X:GOTO 200
```

```
335 GOSUB 2030:GOTO 285
340 INPUT"WHICH BUSINESS";AT:PD=
RND(100):IF PD<=5 OR PD<=40-BG(A
T) THEN PRINT"SUCCESS!!! BUSINES
S "AT"'S OWNER IS DEAD.":PM=1:GO
SUB 2050:BT(AT)=1:FOR PP=1 TO 92
0:NEXT PP:NEXT X:GOTO 200
350 PRINT"YOUR ASSASSIN FAILS IN
 HIS      MISSION.":FOR PP=1 TO
920:NEXT PP:NEXT X:GOTO 200
360 CLS:PRINT"HIRE SPYS":INPUT"H
OW MANY DO YOU WISH TO HIRE";NS:
IF SF=1 THEN PRINT"TOO LATE, ONE
 CHANCE IS ALL YOU GET.":FOR PP=
1 TO 920:NEXT PP:GOTO 200 ELSE 3
70
370 CO=NS*(50+RND(50)):SF=1:PRIN
TNS"SPY(S) COST"CO:GP(XX)=GP(XX)
-CO:IF GP(XX)<0 THEN PRINT"WE DO
N'T WORK FOR PAUPERS.":FOR PP=1
TO 920:NEXT PP:GP(XX)=GP(XX)+CO:
GOTO 200 ELSE FOR PP=1 TO 920:NE
XT PP
380 IF X=0 THEN 200 ELSEFOR X=1
TO NS
385 CLS:PRINT"SEND SPY"X"TO--":P
RINT"1. GUILD":PRINT"2. BUSINESS
":PRINT"3. LIST BUSINESSES"
390 I$=INKEY$:IF I$="" THEN 390
400 I=VAL(I$):ON I GOTO 410,430,
425
410 INPUT"WHICH GUILD";ST:PD=RND
(100):IF PD>40 THEN 420 ELSE PRI
NT"YOUR SPY IS CAUGHT":FOR PP=1
TO 920:NEXT PP:NEXT X:GOTO 200
420 CLS:PRINT"GUILD"ST"HAS:":PRI
NTGP(ST)"GOLD PIECES.":PRINT AF(
ST)"MEN.":PRINT IC(ST)"INCOME PE
R TURN.":PRINT AL(ST)"ALLIES.":F
OR PP=1 TO 920:NEXT PP:NEXT X:GO
TO 200
425 GOSUB 2030:GOTO 385
430 INPUT"WHICH BUSINESS";ST:PD=
RND(100):IF PD<20 THEN PRINT"YOU
R SPY IS CAUGHT.":FOR PP=1 TO 92
0:NEXT PP:NEXT X:GOTO 200
440 CLS:PRINT"BUSINESS"ST"IS:":I
F BT(ST)=1 THEN PRINT"CLOSED":GO
TO 480
450 IF BS(ST)=0 THEN PRINT"NEUTR
AL":GOTO 480
460 IF BS(ST)<C5=4 THEN PRINT"AL
LIED WITH GUILD"BS(ST):GOTO 480
470 PRINT"GUILD"BS(ST)-4" INVEST
S IN THIS BUSINESS."
480 FOR PP=1 TO 920:NEXT PP:NEXT
 X:GOTO 200
490 CLS:PRINT"NEGOTIATE":PRINT"1
. TRY TO FORM AN ALLIANCE":PRINT
"2. INVEST IN AN ALLIED BUSINESS
":PRINT"3. LIST BUSINESSES":PRIN
T"4. MAIN MENU"
500 I$=INKEY$:IF I$="" THEN 500
510 I=VAL(I$):ON I GOSUB 530,590
,640,520
520 RETURN
530 CLS:INPUT"WHICH BUSINESS DO
YOU WISH TO   ALLY WITH";AT
540 IF BS(AT)<>0 THEN PRINT"THAT
 BUSINESS CLAIMS ALLEGIANCE TO A
NOTHER GUILD":FOR PP=1 TO 920:NE
XT PP:GOTO 490 ELSE IF BT(AT)<>0
 THEN PRINT"THAT BUSINESS IS CLO
SED":FOR PP=1 TO 920:NEXT PP:GOT
O 490
550 TB(XX)=TB(XX)-2:IF TB(XX)<0
THEN PRINT"YOU HAVE TOO FEW MEN
TO PERFORM THIS ACTION.":FOR PP=
1 TO 920:NEXT PP:TB(XX)=TB(XX)+2
:GOTO 490
560 INPUT"HOW MUCH GOLD DO YOU W
ISH TO    SEND ALONG";BB:GP(XX)=
GP(XX)-BB:IF GP(XX)<0 THEN PRINT
"SMART GUILDMASTERS DON'T MAKE
 EMPTY PROMISES":FOR PP=1 TO 920
:NEXT PP:GP(XX)=GP(XX)+BB:GOTO 4
90
570 PD=RND(100):IF PD<=(30+BB) T
HEN 580 ELSE PRINT"NEGOTIATIONS
FAIL TO PRODUCE    FAVORABLE RES
ULTS.":FOR PP=1 TO 920:NEXT PP:G
OTO 490
580 PM=0:BS(AT)=XX:PRINT"YOUR AL
LIANCE OFFER IS ACCEPTED.":FOR P
P=1 TO 920:NEXT PP:GOSUB 2050:PR
INT"YOU GAIN"ZX(AT)"GOLD PIECES
INCOME.":FOR PP=1 TO 920:NEXT PP
:AL(BS(AT))=AL(BS(AT))+1:GOTO 49
0
590 CLS:INPUT"WHICH ALLIED BUSIN
ESS DO YOU    WISH TO INVEST IN"
;AT
600 IF BS(AT)=XX THEN 610 ELSE I
F (BS(AT)-4)=XX THEN PRINT"YOU H
AVE ALREADY INVESTED WITH  THAT
BUSINESS.":FOR PP=1 TO 920:NEXT
PP:GOTO 490 ELSE PRINT"YOU AREN'
T ALLIED WITH THEM YET.":FOR PP=
1 TO 920:NEXT PP:GOTO 490
610 IF AT<7 THEN CI=2000 ELSE IF
 AT<27 THEN CI=2600 ELSE IF AT<7
7 THEN CI=280 ELSE IF AT<137 THE
N CI=200 ELSE CI=2100
620 GP(XX)=GP(XX)-CI:IF GP(XX)<0
 THEN PRINT"MAN CAN'T LIVE ON EM
PTY PROMISES.":FOR PP=1 TO 920:N
EXT PP:GP(XX)=GP(XX)+CI:GOTO 490
 ELSE PRINT"IT COSTS"CI"GOLD PIE
CES.":PM=0:BS(AT)=XX+4
630 GOSUB 2050:PRINT"IT ADDS"ZX(
AT)"GOLD PIECES TO YOUR INCOME."
:FOR PP=1 TO 920:NEXT PP:GOTO 49
```

```
0
640 GOSUB 2030:GOTO 490
650 CLS:PRINT"PROTECT CANDIDATES
 AND        BUSINESSES.":PRINT
"1. ASSIGN GUARDS TO CANDIDATE":
PRINT"2. ASSIGN GUARDS TO BUSINE
SS":PRINT"3. HIDE CANDIDATE":PRI
NT"4. MAGICALLY HIDE CANDIDATE":
PRINT"5. MAIN MENU"
660 I$=INKEY$:IF I$="" THEN 660
670 I=VAL(I$):ON I GOSUB 690,740
,780,800,820
680 RETURN
690 IF MH=1 THEN PRINT"YOUR CAND
IDATE IS HIDING":FOR PP=1 TO 920
:NEXT PP:GOTO 650
700 PRINT"YOU HAVE"GG(XX)"GUARDS
 CURRENTLY ON YOUR CANDIDATE.":I
NPUT"HOW MANY DO YOU WISH TO HAV
E NOW";NG:IF NG<0 THEN NG=0
710 IF TB(XX)-(NG-GG(XX))< 0 THE
N PRINT"YOU CAN'T GUARD WITH GHO
STS!":FOR PP=1 TO 920:NEXT PP:GO
TO 650
720 IF NG>GG(XX) THEN TB(XX)=TB(
XX)-(NG-GG(XX)) ELSE TB(XX)=TB(X
X)+(GG(XX)-NG)
730 GG(XX)=NG:GOTO 650
740 GOSUB 2030:INPUT"WHICH BUSIN
ESS DO YOU WISH TO   GUARD";PX:P
RINT"THERE ARE"BG(PX)"GUARDS THE
RE NOW.":INPUT"HOW MANY DO YOU W
ISH TO HAVE NOW";NG:IF NG<0 THEN
 NG=0
750 IF TB-(NG-BG(PX))<0 THEN PRI
NT"YOU MUST THINK THIS ALLY IS
   BLIND!":FOR PP=1 TO 920:NEXT
PP:GOTO 650
760 IF NG>BG(PX) THEN TB(XX)=TB(
XX)-(NG-BG(PX)) ELSE TB(XX)=TB(X
X)+BG(PX)-NG
770 BG(PX)=NG:GOTO 650
780 PRINT"HIDE CANTIDATE":GP(XX)
=GP(XX)-200:IF GP(XX)<0 THEN PRI
NT"LOYALTY ONLY GOES SO FAR.":GP
(XX)=GP(XX)+200:FOR PP=1 TO 920:
NEXT PP:GOTO 650
790 PRINT"YOUR CANDIDATE IS HIDD
EN.":GG(XX)=20:FOR PP=1 TO 920:N
EXT PP:MH=1:GOTO 650
800 PRINT"MAGICALLY HIDE CANDIDA
TE.":IF WF<>XX THEN PRINT"THE WI
ZARD ONLY PROTECTS ALLIES":FOR P
P=1 TO 920:NEXT PP:GOTO 650 ELSE
 GP(XX)=GP(XX)-1000
805 IF GP(XX)<0 THEN PRINT"THE W
IZARD IS YOUR ALLY, NOT     YOUR
SLAVE.":GP(XX)=GP(XX)+1000:FOR P
P=1TO920:NEXT PP:GOTO 650
810 PRINT"THE WIZARD WEAVES MAGI
C AROUND  YOUR CANDIDATE, AND HE
 IS THUS  HIDDEN.":GG(XX)=100:FO
R PP=1 TO 920:NEXT PP:MH=1:GOTO
650
820 RETURN
830 CLS:PRINT"DISCREDIT BUSINESS
ES":PRINT"1. MAGICALLY DISCREDIT
.":PRINT"2. SPREAD RUMORS":PRINT
"3. BLACKMAIL":PRINT"4. RETURN T
O MAIN MENU"
840 I$=INKEY$:IF I$="" OR I$<"1"
 OR I$>"4" THEN 840
850 I=VAL(I$):ON I GOSUB 880,900
,930,870
860 RETURN
870 RETURN
880 CLS:IF WF<>XX THEN PRINT"THE
 WIZARD ONLY HELPS HIS       SUP
PORTERS.":FOR PP=1 TO 920:NEXT P
P:GOTO 830 ELSE GP(XX)=GP(XX)-10
0:IF GP(XX)<0 THENPRINT"THE WIZA
RD DOESN'T DO CHARITY   WORK.":F
OR PP=1 TO 920:NEXT PP:GP(XX)=GP
(XX)+100:GOTO 830
890 GOSUB 2030:INPUT "WHICH BUSI
NESS DO YOU WANT THE  WIZARD TO
ZAP";AT:DV(XX)=IC(XX):IC(XX)=TI(
XX):PM=1:GOSUB 2050:PM=0:TI(XX)=
IC(XX):IC(XX)=DV(XX):PRINT"THE W
IZARD'S SPELL DRIVES AWAY  ALL C
USTOMERS THIS WEEK.":FOR PP=1 TO
 920:NEXT PP:GOTO 830
900 PRINT"SPREAD RUMORS"
910 GP(XX)=GP(XX)-25:IF GP(XX)<0
 THEN PRINT"EVEN RUMORMONGERS NE
ED TO EAT.":GP(XX)=GP(XX)+25:FOR
 PP=1 TO 920:NEXT PP:GOTO 830
920 INPUT"WHICH GUILD DO YOU WIS
H TO ATTACK";AT:PRINT"THE RUMORM
ONGERS WORK TO STOP  CUSTOMERS
FROM DEALING WITH     GUILD"AT:T
I(AT)=TI(AT)-RND(50):FOR PP=1 TO
 920:NEXT PP:GOTO 830
930 CLS:PRINT"BLACKMAIL":INPUT"W
HICH BUSINESS DO YOU WISH TO   P
LY THIS TACTIC ON";AT:GP(XX)=GP(
XX)-150:IF GP(XX)<0 THEN PRINT"B
LACKMAIL'S A CRIME AND WE AIN'TD
OIN' IT FOR FREE.":GP(XX)=GP(XX)
+150:FOR PP=1 TO 920:NEXT PP:GOT
O 830
940 PD=RND(100):IF PD>40 THEN PR
INT"THEIR AIN'T ENOUGH DIRT ON T
HAT BUSINESS":FOR PP=1 TO 920:NE
XT PP:GOTO 830 ELSE PM=1:GOSUB 2
050:GOSUB 950:AL(BS(AT))=AL(BS(A
T))-1:BS(AT)=0:PRINT"THEY BROKE
THEIR ALLIANCE!":FOR PP=1 TO 920
:NEXT PP:GOTO 830
950 IF BS(AT)>4 THEN BS(AT)=BS(A
T)-4
960 RETURN
970 CLS:PRINT"RAISE FUNDS":PRINT
"1. SOLICIT CONTRIBUTIONS FROM
```

# MORE FROM ARK ROYAL!



**A C E S** is a high resolution, completely machine language game of aerial warfare in WWI. Player flies on many missions to bomb enemy targets including airfields, enemy headquarters, anti-aircraft batteries, bridges and factories, but not player's own air base. He must dodge mountains and dogfight with the enemy's best, including, if unlucky, members of the dreaded Flying Circus. After he shoots down five planes he becomes an ACE and receives special consideration; but the game is far from finished. **A C E S** averages about 82 targets and over 100 enemy aircraft per game.

**A C E S** plays in real time and displays flight simulated dash and controls. Operates from the keyboard. Included in the display is a high resolution mini-screen featuring terrain, targets, and player's relative ground position. There are 8 zones in each map which changes as player flies over it. Game Save. (It could take days to win!) In addition, **NEWMAP** is included to allow for the creation of a zillion new maps. **A C E S** was created in part with AGS, developed by Ken Schunk. For all CoCo's.

**WAR AT SEA:** Wooden Ships simulate ship to ship battles during the 18th Century. Player controls a number of sailing ships from different nations and must pit his seamanship against the computer or another player.

**RED ALERT:** a starship combat simulator. Object of the game is to defeat the computer controlled enemy vessel by using your ship's capacities, strategic maneuvers, and your own smarts.

## NEW

| | |
|---|---|
| **A C E S:** WWI Aerial Warfare (CC64K D HR ML) | $29 |
| **RED ALERT:** Star Ship Warfare (CC64K D HR MLS J) | $27 |
| **WAR AT SEA:** Wooden Ships (CC64K D HR MLS J) | $25 |

| | |
|---|---|
| **Pro Football:** Strategy Gridiron game (CC3 128K HR B) | $20 |
| **Okinawa:** The Big Invasion (Screen Dump inc) (CC64K D HR ML) | $27 |
| **Blitzkrieg West:** A Bigger Bulge (CC64K D HR ML) | $27 |
| **Bataan:** Historial & Hypothetical games in one (CC64K D HR ML) | $29 |
| **Desert Fox:** Rommel (CC64K D HR MLS) | $27 |
| **Task Force:** Modern Naval War in the Med (CC64K D HR MLS J) | $27 |
| **D DAY:** The 6th of June (CC64K HR ML) | $25 |
| **Battle Hymn:** Battle of Gettysburg (CC64K D HR ML) | $25 |
| **Company Commander:** Squad Level Wargame (CC32K SG MLS) | $25 |
| (House to House Module included in Company Commander)<br>Additional Modules for Company Company 3.0 | |
| **River Crossing** | $17 |
| **Gemini** | $17 |
| **Cauldron** | $17 |
| **Beach Head** | $17 |
| **Fire One!** Submarine Simulation (CC3 D HR B) | $25 |
| **Fire & Steel:** Waterloo Campaign (CC64K D HR MLS) | $22 |

| | |
|---|---|
| **Luftflotte:** Battle of Britain (CC32K SG MLS) | $25 |
| **Stalingrad:** The turning point. (CC64K HR ML) | $25 |
| **Final Frontier:** War in Space (CC32K D HR MLS) | $25 |
| **Barbarossa:** The War in Russia (CC64K HR ML) | $22 |
| **RedStar:** Nato vs Warsaw Pact (CC32K D HR ML) | $22 |
| **DarkHorse:** Redstar Sequel (CC64K D HR ML) | $22 |
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| **Battle of the Bulge** 1 or 2 player (CC32K SG B) | $15 |
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| **Rubicon II:** Invasion game (CC32K SG B) | $10 |
| **Guadalcanal:** America Strikes Back (CC32K SG MLS) | $10 |
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| **Galactic Taipan:** Economics in Space (CC32K SG B) | $10 |

| | |
|---|---|
| Keyboard General: Bi-monthly newsletter yearly sub | $15 |

**Barbarossa, Luftflotte, Battle Hymn** (256K) available Tandy 1000

**New for the Tandy 1000**

| | |
|---|---|
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**Codes:** CC — Color Computer, all versions CC3 — CoCo 3 only
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```
 WIZARD.":PRINT"2. STEAL":PRI
NT"3. RETURN TO MAIN MENU"
980 I$=INKEY$:IF I$="" OR I$<"1"
 OR I$>"3" THEN 980
990 I=VAL(I$):ON I GOSUB 1020,10
90,1010
1000 RETURN
1010 RETURN
1020 CLS:PRINT"ASK THE WIZARD TO
 DONATE MONEY":INPUT"HOW MUCH MO
NEY ARE YOU GOING TO ASK HIM FOR
";AD:WR=AD+RND(200):IF WF=XX THE
N WR=WR-RND(50)
1030 IF WV=1 THEN WR=200 ELSE WV
=1
1040 IF WR<100 THENPRINT"THE WIZ
ARD SMILES AND GRANTS YOU"AD"GOL
D PIECES.":GP(XX)=GP(XX)+AD:FOR
PP=1 TO 920:NEXT PP:GOTO 970
1050 IF WR<175 THEN PRINT"THE WI
ZARD TELLS YOU TO GO      STICK
YOUR HEAD IN A PIG.":FOR PP=1 TO
 920:NEXT PP:GOTO 970
1060 PRINT"THE WIZARD GROWS ANGR
Y AT YOUR  UNMITIGATED OBNOXIOUS
NESS."
1070 FOR FE=1 TO 144: IF BS(FE)=
XX OR BS(FE)=(XX+4) THEN PRINT"T
HE WIZARD DESTROYS BUSINESS     "
;FE:PM=1:BT(FE)=1:GOSUB 2050:NEX
T FE
1080 PRINT"YOU ARE THROWN FROM H
IS HOUSE.":FOR PP=1 TO 920:NEXT
PP:GOTO 970
1090 CLS:PRINT"STEAL":PRINT"1. F
ROM A GUILD":PRINT"2. FROM A BUS
INESS":PRINT"3. FROM THE WIZARD"
1100 I$=INKEY$:IF I$="" OR I$<"1
" OR I$>"3" THEN 1100
1110 I=VAL(I$):ON I GOTO 1120,12
00,1270
1120 CLS:INPUT"WHICH GUILD DO YO
U WANT TO STEALFROM";GS:INPUT "H
OW MANY MEN DO YOU WISH TO     S
END";SM:IF SM>TB(XX) OR SM<1 THE
N PRINT"ILLUSIONARY MEN TAKE ONL
Y ILLU- SIONARY GOLD":FOR PP=1 T
O 920:NEXT PP:GOTO 970 ELSE TB(X
X)=TB(XX)-SM
1130 IF TI(XX)=-10000 THEN TI(XX
)=IC(XX)
1140 PD=RND(100):IF PD+(SM*2)-(G
G(GS)+60)>0 THEN 1150 ELSE 1170
1150 PD=RND(250):IF PD>GP(GS) TH
EN PD=GP(GS)
1160 PRINT"YOUR THIEVES SUCCEEDE
D IN       TAKING"PD"GOLD PIECES
.":GP(XX)=GP(XX)+PD:FOR PP=1 TO
920:NEXT PP:GOTO 970
1170 PD=RND(100):IF PD<51 THEN 1
180 ELSE 1190
1180 PRINT"YOUR THIEVES WERE CAU
GHT...AND  EXECUTED":AF(XX)=AF(X
X)-SM:FOR PP=1 TO 920:NEXT PP:GO
TO 970
1190 PRINT"YOUR THIEVES WERE DIS
COVERED... BUT THEY ESCAPED.":FO
R PP=1 TO 920:NEXT PP:GOTO 970
1200 CLS:INPUT"WHICH BUSINESS DO
 YOU WISH TO  STEAL FROM (0 FOR
 LIST)";AT:IF AT=0 THEN GOSUB 19
00:GOTO 1200
1210 INPUT"HOW MANY MEN ARE YOU
SENDING";SM:IF SM>TB(XX) OR SM<1
 THEN PRINT"YOUR MATH SKILLS WER
E PROBABLY  WHAT CAUSED YOUR POV
ERTY IN THE FIRST PLACE":FOR PP=
1 TO 920:NEXT PP:GOTO 970
1220 TB(XX)=TB(XX)-SM:PD=RND(100
):IF (PD+SM*2)-(BG(AT)+40)>0 THE
N 1230 ELSE 1250
1230 PD=RND(100):PRINT"YOUR THIE
VES STRUCK SWIFTLY AND STOLE"PD"
GOLD PIECES":GP(XX)=GP(XX)+PD:FO
R PP=1 TO 920:NEXT PP:GOTO 970
1240 PD=RND(100): IF PD>36 THEN
1260 ELSE 1250
1250 PRINT"THE CITY GUARD JUST L
OVED      KILLING YOUR THIEVES
FOR       'RESISTING ARREST'.":
AF(XX)=AF(XX)-SM:FOR PP=1 TO 920
:NEXT PP:GOTO 970
1260 PRINT"YOUR THIEVES MESSED U
P, BUT WERENOT CAPTURED":FOR PP=
1 TO 920:NEXT PP:GOTO 970
1270 CLS:INPUT"HOW MANY BRAVE SO
ULS ARE GOING  TO ROB THE WIZARD
";SM
1280 IF TB(XX)<SM OR SM<1 THEN P
RINT"THE WIZARD DOESN'T BELIEVE
IN   NON-MAGICAL ILLUSIONS":FOR
PP=1 TO 920:NEXT PP:GOTO 970
1290 TB(XX)=TB(XX)-SM:PD=RND(100
):IF PD<50 THEN WQ=1 ELSE WQ=10
1300 PD=RND(100):IF (PD-SM)<(WQ+
1) THEN 1310 ELSE 1320
1310 PD=RND(10000):PRINT"YOUR ME
N ARE SURE TO REACH      LEGENDA
RY STATUS. YOU GOT LUCKY AND STO
LE"PD"GOLD PIECES FROM A CARELES
S WIZARD.":GP(XX)=GP(XX)+PD:FOR
PP=1 TO 920:NEXT PP:GOTO 970
1320 IF WQ<2 THEN 1330 ELSE 1340
1330 PRINT"THE WIZARD WAS HOME.
ALL YOUR   MEN MET HORRIBLE DEAT
HS BUT THE PROPERTY DAMAGE WAS M
INIMAL.":AF(XX)=AF(XX)-SM:FOR PP
=1 TO 920:NEXT PP:GOTO 970
1340 PRINT"THE WIZARD'S DEADLY M
AGIC TRAPS DESTROYED YOUR HAPLES
S THIEVES.":AF(XX)=AF(XX)-SM:FOR
 PP=1 TO 920:NEXT PP:GOTO 970
1350 CLS:PRINT"ARMED CONFLICT":P
RINT"1. RECRUIT LOCALS":PRINT"2.
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(See January '88 review)

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This 100% machine language arcade game was written exclusively to take advantage of your CoCo 3. The colors are brilliant, the graphics are sharp, and the action is hot! (See Dec. '87 review) Disk.......................... $19.95

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```
 HIRE MERCENARIES":PRINT"3. TRAI
N AND EQUIP RECRUITS":PRINT"4. A
MBUSH A GUILD":PRINT"5. AMBUSH A
 BUSINESS":PRINT"6. RETURN TO MA
IN MENU"
1360 I$=INKEY$:IF I$="" OR I$<"1
" OR I$>"6" THEN 1360
1370 I=VAL(I$):ON I GOSUB 1400,1
420,1450,1470,1500,1390
1380 RETURN
1390 RETURN
1400 IF TB(XX)<2 THEN PRINT"YOU
DON'T HAVE ENOUGH MEN TO    RECR
UIT.":FOR PP=1 TO 920:NEXT PP:GO
TO 1350 ELSE TB(XX)=TB(XX)-2:INP
UT"HOW MUCH MONEY ARE YOU GOING
TO SPEND";SM
1410 IF SM>GP(XX) THEN PRINT"PRO
MISES... BUT WHERE'S THE     MON
EY":FOR PP=1 TO 920:NEXT PP:GOTO
 1350 ELSE GP(XX)=GP(XX)-SM:PD=R
ND(50):SR=INT(SM/PD):RC(XX)=RC(X
X)+SR:PRINT"YOU BEAT THE BUSHES
AND FOUND"SR"NEW RECRUITS":FOR P
P=1 TO 920:NEXT PP:GOTO 1
1420 IF TB(XX)<1 THEN PRINT"THEY
 WON'T JUST COME TO YOU, YOU MUS
T GO TO THEM.":FOR PP=1 TO 920:N
EXT PP:GOTO 1350 ELSE TB(XX)=TB(
XX)-1
1430 INPUT"HOW MUCH TO YOU WISH
TO SPEND   ON MERCS";SM:IF SM>GP
(XX) THEN PRINT"MERCENARIES ARE
PAID SOLDIERS.":FOR PP=1 TO 920:
NEXT PP:GOTO 1350 ELSE GP(XX)=GP
(XX)-SM:SR=INT(SM/100):PRINT"YOU
 HIRED"SR"MERCS.":AF(XX)=AF(XX)+
SR:FOR PP=1 TO 920:NEXT P
1440 GOTO 1350
1450 CLS:PRINT"YOU HAVE"RC(XX)"R
ECRUITS.":INPUT"HOW MUCH DO YOU
WANT TO SPEND ONTRAINING";SM:IF
GP(XX)<SM THEN PRINT"TEACHERS' S
ALARIES ARE A BIT   HIGHER THAN
 WHAT YOU HAVE, BUT  YOUR OFFER
WAS NICE.":FOR PP=1 TO 920:NEXT
PP:GOTO 1350
1460 GP(XX)=GP(XX)-SM:PD=RND(150
):SR=INT(SM/PD):IF SR>RC(XX) THE
N SR=RC(XX)
1465 PRINT"YOU TRAINED AND EQUIP
ED"SR"    RECRUITS.":RC(XX)=RC(
XX)-SR:AF(XX)=AF(XX)+SR:FOR PP=1
 TO 920:NEXT PP:GOTO 1350
1470 CLS:INPUT"WHICH GUILD DO YO
U WISH TO      AMBUSH";AG:INPUT"
HOW MANY MEN WILL YOU SEND";SM:I
F SM>TB(XX) THEN PRINT"DON'T SEN
D MORE MEN THAN YOU   HAVE":FOR
 PP=1 TO 920:NEXT PP:GOTO 1350
1475 TB(XX)=TB(XX)-SM
1480 OF=GG(AG):GOSUB 2155:IF LO=
XX THEN PRINT"YOU HAVE LOST YOUR
 BID TO       DESTROY GUILD"AG:F
OR PP=1 TO 920:NEXT PP:GOTO 1350
1490 PRINT"YOU HAVE WON!!! CANDI
DATE"AG" IS DEAD":GS(AG)=1:FOR P
P=1 TO 920:NEXT PP:GOTO 1350
1500 CLS:INPUT"WHICH BUSINESS WI
LL YOU AMBUSH";AG:INPUT"HOW MANY
 MEN WILL YOU SEND";SM:IF SM>TB(
XX) THEN PRINT"YOU HAVE TOO FEW
TROOPS LEFT.":FOR PP=1 TO 920:NE
XT PP:GOTO 1350
1505 TB(XX)=TB(XX)-SM
1510 OF=BG(AG):GOSUB 2155:IF LO=
XX THENPRINT"BUSINESS"AG"IS STIL
L OPEN.":FOR PP=1 TO 920:NEXT PP
:GOTO 1350
1520 PRINT"YOU HAVE SUCCEEDED IN
 CLOSING   BUSINESS"AG".":BT(AG)
=1:PM=1:AT=AG:GOSUB 2050:FOR PP=
1 TO 920:NEXT PP:GOTO 1350
1530 IF DB+1=NP THEN FOR X=1 TO
4:IF GS(X)<>1 THEN CLS:SOUND 100
,1:PRINT"PLAYER "X" REPRESENTING
 THE     GUILD "GN$(X)" IS THE W
INNER":GOTO 1640
1540 CLS:PRINT"ELECTION DAY HAS
COME...WHO WILLBE THE NEXT KING"
:FOR X=1 TO NP:TV(X)=((IC(X)*2)+
(GP(X)*5)+(AL(X))+RC(X)+AF(X)*3)
1550 KK(X)=TV(X):NEXT X:PRINT"TH
E KING IS THE CANDIDATE FROM"
1560 Y=0
1570 Y=Y+1
1580 IF Y>NP THEN 1630
1590 IF TV(X)<0 THEN 1630
1600 FOR Z=1 TO NP
1610 IF KK(Y)>KK(X) THEN X=Y
1620 NEXT Z
1625 GOTO 1570
1630 PRINTGN$(X);"(GUILD"X")"
1640 I$=INKEY$:IF I$="" THEN 164
0
1650 INPUT"DO YOU WISH TO PLAY A
GAIN";X$:IF LEFT$(X$,1)="Y" THEN
 RUN ELSE POKE 113,0:EXEC 40999
1660 CLS:PRINT"STATUS REPORT":PR
INT"GOLD PIECES"GP(XX):PRINT"INC
OME"IC(XX):PRINT"INCOME THIS TUR
N"TI(XX):PRINT"LAST TURN'S INCOM
E"LI(XX):PRINT"RECRUITS"RC(XX):P
RINT"TROOPS";AF(XX):PRINT"UNCOMI
TTED TROOPS"TB(XX)
1670 I$=INKEY$:IF I$="" THEN 167
0
1680 CLS:PRINT"ALLIES"AL(XX):PRI
NT"ALLY NUMBERS:";:FOR FF=1 TO 1
44:IF BS(FF)=XX AND BT(FF)<>1 TH
EN PRINTFF;:NEXT FF ELSE NEXT FF
1690 PRINT:PRINT
1700 PRINT"INVESTMENTS:";:FOR FF
=1 TO 144:IF BS(FF)=XX+4 AND BT(
```

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*(all require 64K & dual drives)*

| | |
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**Bio Detector**
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```
FF)<>1 THEN PRINTFF;:NEXT FF ELS
E NEXT FF
1710 PRINT:PRINT
1720 PRINT"HIT 1 FOR MENU OR 2 T
O END TURN."
1730 I$=INKEY$:IF I$="" OR I$<"1
" OR I$>"2" THEN 1730
1740 I=VAL(I$):ON I GOTO 70,160
1750 IF DF(XX)=1 THEN 160 ELSE I
F ZZ<2 THEN 1835
1760 FOR PP=1 TO NP:Z(PP)=WB(PP)
:X=0:NEXT PP
1770 X=X+1
1780 IF X>4 THEN 1800
1790 IF Z(X)<0 THEN 1770
1800 FOR Y=1 TO 4
1810 IF Z(Y)>Z(X) THEN X=Y
1820 NEXT Y
1830 WF=X
1835 FOR RR=1 TO 144:IF BS(RR)=X
X OR BS(RR)=XX+4 THEN BG(RR)=0:N
EXT RR ELSE NEXT RR
1840 CLS:PRINT@268,"PLAYER"XX:PR
INT@301,"WEEK"ZZ:SOUND 100,1
1850 I$=INKEY$:IF I$="" THEN 185
0
1860 PRINT"WELCOME GUILDMASTER O
F THE GUILD"GN$(XX):IF WF=XX THE
N PRINT"THE WIZARD SENDS A NOTE
OF      ALLIANCE."
1870 FOR PP=1 TO 920:NEXT PP
1875 INPUT"HOW MUCH GOLD DO YOU
WISH TO    SPEND ON THE WIZARD";
WB(XX):GP(XX)=GP(XX)-WB(XX)
1880 GP(XX)=GP(XX)+TI(XX):TI(XX)
=IC(XX):TB(XX)=AF(XX):LI(XX)=QI(
XX)
1883 RETURN
1885 TI(XX)=IC(XX):TB(XX)=AF(XX)
1890 RETURN
1900 CLS:PRINT"MONEYLENDERS":FOR
 Y=1 TO 6:PRINTY;:PRINTML$(Y):NE
XT Y:GOTO 2010
1910 CLS:PRINT"INNS":FOR Y=1 TO
20
1920 IF Y=15 THEN I$=INKEY$:IF I
$="" THEN 1920
1930 PRINTY+6;:PRINT IN$(Y):NEXT
 Y:GOTO 2010
1940 CLS:PRINT"CRAFTSMEN":FOR Y=
1 TO 50
1950 IF Y=15 OR Y=30 OR Y=45 THE
N I$=INKEY$:IF I$="" THEN 1950
1960 PRINTY+26;:PRINT CM$(Y):NEX
T Y:GOTO 2010
1970 CLS:PRINT"FARMERS":FOR Y=1
TO 60
1980 IF Y=15 OR Y=30 OR Y=45 OR
Y=55 THEN I$=INKEY$:IF I$="" THE
N 1980
1990 PRINTY+76;:PRINT FM$(Y):NEX
T Y:GOTO 2010
```

```
2000 CLS:PRINT"LIVESTOCK TRADERS
":FOR Y=1 TO 8:PRINTY+136;:PRINT
 LT$(Y):NEXT Y
2010 PRINT"(R)ETURN OR (C)ONTINU
E
2020 I$=INKEY$:IF I$="R" THEN RE
TURN ELSE IF I$="C" THEN 2030 EL
SE 2020
2030 CLS:PRINT"1. MONEYLENDERS":
PRINT"2. INNS":PRINT"3. CRAFTSME
N":PRINT"4. FARMERS":PRINT"5. LI
VESTOCK TRADERS"
2040 INPUT WG:IF WG<1 OR WG>5 TH
EN 2030 ELSE ON WG GOTO 1900,191
0,1940,1970,2000
2050 IF BS(AT)<1 THEN 2060 ELSE
IF BS(AT)<5 THEN 2070 ELSE 2090
2060 RETURN
2070 QD(AT)=BS(AT):IF AT<7 THEN
RN=200 ELSE IF AT<27 THEN RN=260
 ELSE IF AT<77 THEN RN=28 ELSE I
F AT<137 THEN RN=20 ELSE RN=210
2080 GOTO 2100
2090 QD(AT)=BS(AT):BS(AT)=BS(AT)
-4:IF AT<7 THEN RN=450 ELSE IF A
T<27 THEN RN=600 ELSE IF AT<77 T
HEN RN=60 ELSE IF AT<137 THEN RN
=40 ELSE RN=420
2100 IF PM=1 THEN 2110 ELSE 2120
2110 IC(BS(AT))=IC(BS(AT))-ZX(AT
):AL(BS(AT))=AL(BS(AT))-1:BS(AT)
=QD(AT):RETURN
2120 ZX(AT)=ZX(AT)+RND(RN-ZX(AT)
):IC(BS(AT))=IC(BS(AT))+ZX(AT):B
S(AT)=QD(AT):QI(BS(AT))=IC(BS(AT
)):RETURN
2130 CLS:PRINT"DO YOU REALLY,REA
LLY WANT TO    QUIT THIS AWESOME
LLY FUN GAME?  (ARE YOU POSITIVE
 ???)"
2140 INPUT VV$:IF VV$="Y" OR VV$
="YES" THEN END
2150 GOTO 70
2155 HA=SM:HB=OF
2160 OA=(OF*2)+20:AA=SM:PRINTAA"
ATTACKERS";"  "OF"DEFENDERS"
2170 XF=RND(10):YF=RND(15):IF (X
F+OA)>(YF+AA) THEN SM=SM-INT(((X
F+OA)-(YF+AA))/2) ELSE OF=OF-INT
(((YF+AA)-(OA+XF))/2)
2180 IF OF<0 THEN OF=0:LO=AG ELS
E IF SM<0 THEN SM=0:LO=XX
2190 PRINT"ATTACKING FORCES:"SM:
PRINT"DEFENDING FORCES:"OF
2200 IF OF=0 OR SM=0 THEN HA=ABS
(SM-HA):AF(XX)=AF(XX)-HA:HB=ABS(
OF-HB):AF(AT)=AF(AT)-HB:RETURN E
LSE 2160
2210 CLS:PRINT"BAD GONZO WHOPPER
 ERROR. IT'S   ALL YOUR FAULT!":
END
```

*Help for the amateur BASIC programmer*

# Easy As Pie

## By Raymond Lueders

*Utilities 1* is a simple program to aid amateur programmers in performing certain functions from within their BASIC programs. It can also be used as a utility program to perform certain functions, such as Set Maximum Memory or Change Printer Line Width, etc.

This program is based strictly on `PEEK` and `POKE` commands. Upon execution, some of these commands will erase *all* of the memory contents. For this reason I highly recommend making a backup copy before running it. For example, Set Maximum Memory command allows you to access those addresses of memory set aside by the CoCo for graphics and, upon execution, will erase all the memory contents. Cold Start (re-boot) also erases the memory.

There are two uses for this program. First, it can be used as an aid for performing a certain function in your BASIC program. Let's say you want your program to cold start after execution and don't know what command to use. At the main menu, type the number for Cold Start and you will see the command to use preceded with Line 100, which I used as an example. Copy down the command and place it in your program as it applies.

You can use *Utilities 1* as a utility program to perform a certain function such as Set Printer Line Width (depending on your printer type). From the main menu, enter the number for Set Printer Line Width. You are prompted to execute it. After execution, you will have set your printer's line width to that specified.

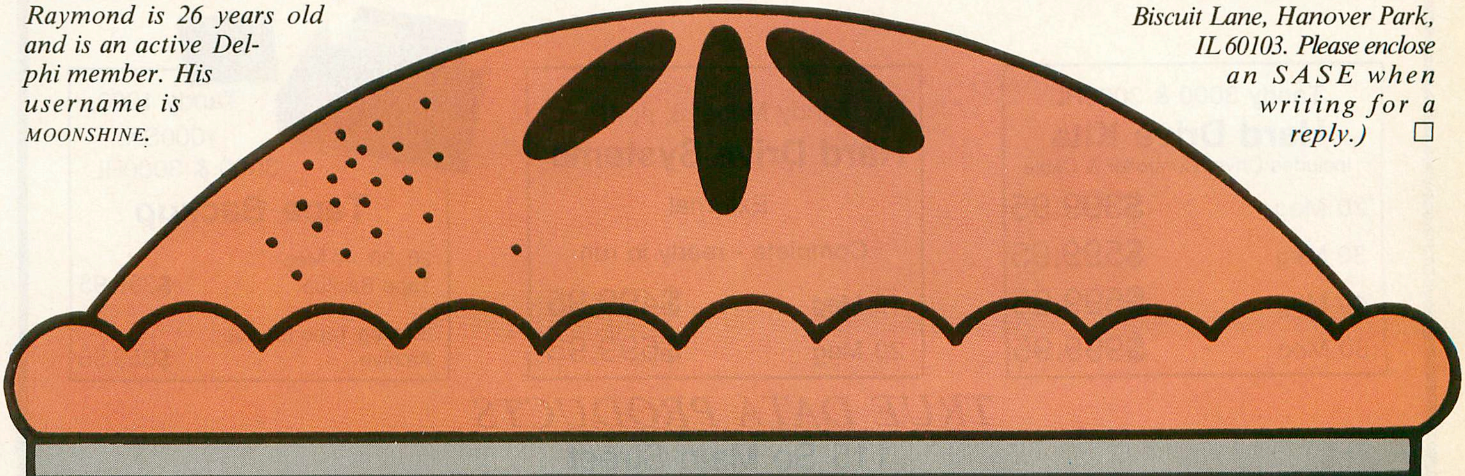
Take special care when typing in this program because typing in the wrong `PEEK` or `POKE` command may give unpredictable results. I also have included remarks and reset commands to complete the function. After executing one `PEEK` or `POKE` command, others executed may not function properly, depending on which ones were used prior to execution.

After running *Utilities 1* a couple of times, you will notice that I used many of the commands myself. One example is Printer Not Ready, which is very useful in programs that use the printer (a simple error-trapping routine, you might say). To exit *Utilities 1*, type `14`.

*(Questions about this program may be directed to the author at 1341 Sea Biscuit Lane, Hanover Park, IL 60103. Please enclose an SASE when writing for a reply.)* ☐

---

*Raymond Lueders lives in Hanover Park, Illinois, and is employed as purchasing manager with Heinz Plastic Mold Company. Raymond is 26 years old and is an active Delphi member. His username is MOONSHINE.*



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For Tandy 1000, SX, TX

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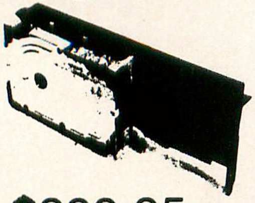

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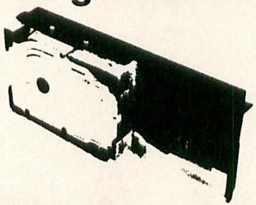
## 20 Meg Hard Card



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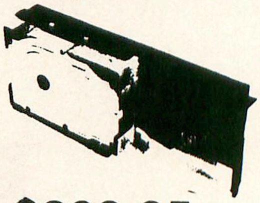
## 30 Meg Hard Card



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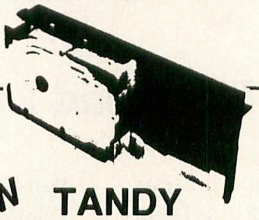

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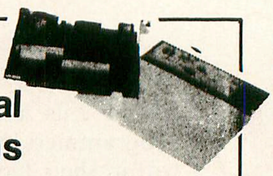

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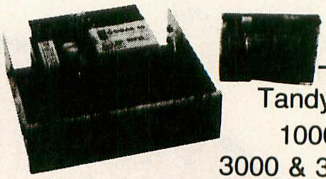

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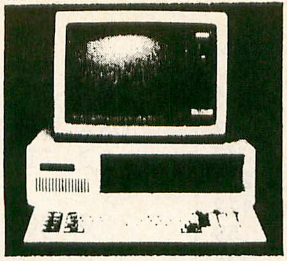

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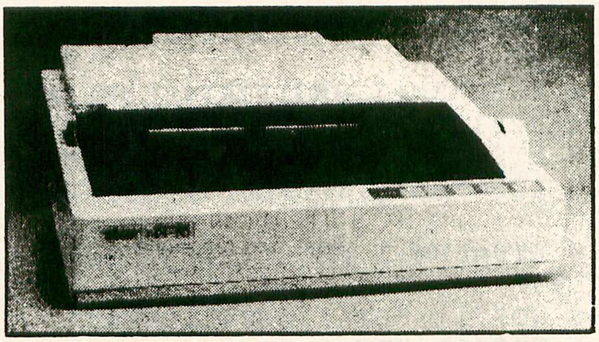

| | |
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*includes:*

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- Interface
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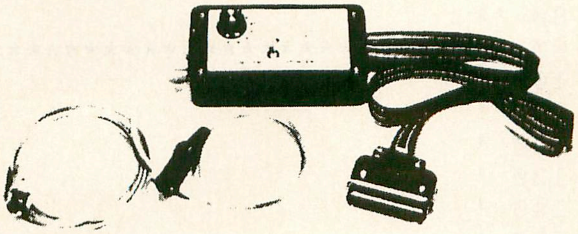

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|  |  |  |  |
|---|---|---|---|
| 210 | 169 | 2210 | 93 |
| 360 | 108 | 2420 | 31 |
| 570 | 179 | 2670 | 43 |
| 780 | 95 | 2840 | 202 |
| 1100 | 144 | 3020 | 112 |
| 1270 | 88 | 3200 | 59 |
| 1470 | 201 | 3420 | 235 |
| 1640 | 207 | 3560 | 202 |
| 1830 | 115 | 3750 | 155 |
| 1990 | 252 | END | 65 |

**The listing:** UTILITY1

```
10 '****************************
20 '*                          *
30 '*       UTILITIES 1        *
40 '*                          *
50 '*   BY:  RAYMOND LUEDERS   *
60 '*      HANOVER PK, IL      *
70 '*                          *
80 '*                          *
90 '****************************
100 '
110 '
120 '
130 '
140 '
150 '
160 GOTO230
170 A=PEEK(116)*256+PEEK(117)-10
0:X=INT(A/256):Y=A-(X*256):FORI=
A TO A +72:READB:POKEI,B:NEXTI:P
OKE362,126:POKE363,X:POKE364,Y:C
LEAR200,A:DATA50,100,52,20,189,1
61,121,132,127,52,2,189,161,193,
142,4,254,189,167,211,182,1,83,1
29,191,38,37
180 DATA53,22,150,255,129,8,38,7
,90,39,31,48,31,32,15,129,32,37,
22,129,123,36,18,193,249,36,14,1
67,128,92,189,162,130,52,20,32,2
01,53,22,151,255,57,198,1,32,251
190 CLS:PRINT:PRINT" KEY REPEAT
NOW ACTIVATED."
200 PRINT" HOLD DOWN A KEY AND P
RESS "
210 PRINT" THE <CLEAR> KEY.":PRI
NT:
220 END
230 '
240 CLS0
250 PRINT:PRINT" ARE YOU USING A
 COCO 3? (Y/N)  ";:
260 COCO$=INKEY$:IF COCO$="" THE
N 260
270 IF COCO$="Y" THEN 280 ELSE 2
90
280 PALETTE12,0:PALETTE13,48:ON
BRK GOTO 280:GOTO 300
290 IF COCO$="N" THEN 300 ELSE 2
60
300 GOTO3900
310 'DEFINITIONS FOR HI-RES CHR
320 LA$="BM+1,0U4E2F2D2BL4R4D2BR
3"
330 LB$="BM+1,0U6R3F1D1G1BL3R3F1
D1G1BL3R3BR4"
340 LD$="BM+1,0BR3E1U4H1L3D6R3BR
4"
350 LE$="BM+1,0BR5BU6L5D3R3BL3D3
R5BR3"
360 LI$="BM+1,0BU6R4BL2D6BL2R4BR
3"
370 LL$="BM+1,0U6BD6R5BR3"
380 LM$="BM+1,0U6R1F2D1U1E2R1D6B
R3"
390 LN$="BM+1,0U6F5BU5D6BR3
400 LO$="BM+1,0BR3L2H1U4E1R2F1D4
G1BR4"
410 LR$="BM+1,0U6R3F1D1G1BL3R3F1
D2BR3"
420 LS$="BM+1,0BU1F1R2E1U1H1L2H1
U1E1R2F1BD5BR3"
430 LT$="BM+1,0BR6BU6L6BR3D6BR5"
440 LU$="BM+1,0BU6D5F1R3E1U5BD6B
R3"
450 LY$="BM+1,0BU6D2F2E2U2BL2BD4
D2BR5"
460 NO$(1)="BM+1,0BU4E2D6BR3"
470 NO$(9)="BM+1,0BU1F1R2E1U4H1L
2G1D1F1R3BD3BR4"
480 NO$(8)="BM+1,0BR3L2H1U1E1H1U
1E1R2F1D1G1L2BR2F1D1G1BR4"
490 NO$(6)="BM+1,0BR5BU5H1L2G1D4
F1R2E1U1H1L3BD3BR6"
500 MUS$="O4;T10;V12;A;V9;A;V6;A
;V3;A;V2;A;V1;A;"
510 'DISPLAY TITLE PAGE
520 PMODE4,1:PCLS:SCREEN1,1
530 PLAYMUS$
540 LINE(8,8)-(246,162),PSET,B
550 LINE(10,10)-(244,160),PSET,B
560 LINE(12,12)-(242,158),PSET,B
570 LINE(14,14)-(240,156),PSET,B
580 LINE(16,16)-(238,154),PSET,B
590 LINE(18,18)-(236,152),PSET,B
600 LINE(20,20)-(234,150),PSET,B
610 LINE(22,22)-(232,148),PSET,B
620 LINE(27,26)-(227,144),PSET,B
630 FOR X=1TO500:NEXT
640 DRAW"BM84,44;XLU$;XLT$;XLI$;
XLL$;XLI$;XLT$;XLI$;XLE$;XLS$;"
```

```
650 DRAW"BM174,44;XNO$(1);"
660 FORX=1TO500:NEXT
670 DRAW"BM118,64;XLB$;XLY$;"
680 FORX=1TO500:NEXT
690 DRAW"BM67,104;XLR$;XLA$;XLY$
;XLM$;XLO$;XLN$;XLD$;"
700 DRAW"BM134,104;XLL$;XLU$;XLE
$;XLD$;XLE$;XLR$;XLS$;"
710 FORX=1TO500:NEXT
720 DRAW"BM66,104;XLR$;XLA$;XLY$
;XLM$;XLO$;XLN$;XLD$;"
730 FORX=1TO200:NEXT
740 DRAW"BM133,104;XLL$;XLU$;XLE
$;XLD$;XLE$;XLR$;XLS$;"
750 FORX=1TO1000:NEXT
760 DRAW"BM68,104;XLR$;XLA$;XLY$
;XLM$;XLO$;XLN$;XLD$;"
770 FORX=1TO200:NEXT
780 DRAW"BM135,104;XLL$;XLU$;XLE
$;XLD$;XLE$;XLR$;XLS$;"
790 FORX=1TO500:NEXT
800 DRAW"BM110,120;XNO$(1);XNO$(
9);XNO$(8);XNO$(6);"
810 FORX=1TO500:NEXTX
820 Y=244:Z=160
830 FORX=10TO85STEP2
840 LINE(X,X)-(Y,Z),PSET,B
850 Y=Y-2:Z=Z-2
860 NEXTX
870 FORX=1TO100:NEXT
880 Y=244:Z=160
890 FORX=10TO85
900 LINE(X,X)-(Y,Z),PSET,B
910 Y=Y-1:Z=Z-1
920 NEXTX
930 PLAYMUS$
940 GOSUB1330'MAIN MENU
950 IF MAIN$="1"THENGOSUB1530
960 IF MAIN$="2"THENGOSUB1650
970 IF MAIN$="3"THENGOSUB1770
980 IF MAIN$="4"THENGOSUB1870
990 IF MAIN$="5"THENGOSUB2190
1000 IF MAIN$="6"THENGOSUB2710
1010 IF MAIN$="7"THENGOSUB2860
1020 IF MAIN$="8"THENGOSUB3080
1030 IF MAIN$="9"THENGOSUB3210
1040 IF MAIN$="10"THENGOSUB3340
1050 IF MAIN$="11"THENGOSUB3450
1060 IF MAIN$="12"THENGOSUB3700
1070 IF MAIN$="13"THENGOSUB1230
1080 IF MAIN$="14"THENGOSUB1100
1090 GOTO940
1100 CLS:PRINT:PRINT" YOU MAY DI
RECT QUESTIONS TO ME"
1110 PRINT" PLEASE SEND A SASE T
O:":PRINT""
1120 PRINT"    RAYMOND LUEDERS
1130 PRINT"    1341 SEA BISCUIT
LN"
```

The RAINBOW

THE COLOR COMPUTER MONTHLY MAGAZINE

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```
1140 PRINT"    HANOVER PARK IL 6
0103"
1150 PRINT
1160 PRINT" YOU CAN ALSO GET HOL
D OF ME ON"
1170 PRINT" DELPHI."
1180 PRINT" USERNAME 'MOONSHINE'
 FROM THE"
1190 PRINT" COCO SIG."
1200 PRINT"   -RAY-";:
1210 PRINT:PRINT"":PRINT" HIT AN
Y KEY."
1220 EXEC44539:END
1230 ' EXIT TO BASIC
1240 CLS:PRINT@8,"COLD START POK
E"
1250 PRINT:PRINT" CMD: 100 POKE1
13,0:EXEC40999":PRINT:PRINT" COM
MENTS: COLD-START"
1260 PLAYMUS$
1270 PRINT:PRINT" warning MEMORY
 WILL BE ERASED":GOSUB 3880
1280 IF A$="Y" THEN1290ELSERETUR
N
1290 POKE113,0:EXEC40999
1300 RETURN
1310 '
1320 'MAIN MENU
1330 CLS:PRINT@7,"*** MAIN MENU
***"
1340 PRINT
1350 PRINT"(1)  PRINT DIRECTORY"
1360 PRINT"(2)  PRINTER NOT READ
Y PEEK"
1370 PRINT"(3)  DISABLE THE RESE
T BUTTON"
1380 PRINT"(4)  KEY REPEAT"
1390 PRINT"(5)  SET PRINTER LINE
 WIDTH"
1400 PRINT"(6)  SET MAXIMUM MEMO
RY"
1410 PRINT"(7)  HI SPEED POKE CM
D"
1420 PRINT"(8)  ALTERNATE CMD FO
R INKEY$"
1430 PRINT"(9)  SLOW KEYBOARD RE
SPONSE"
1440 PRINT"(10) DISK OR CASSETTE
 PEEK"
1450 PRINT"(11) DISK DRIVE LIGHT
 POKE"
1460 PRINT"(12) DISABLE ALL FUNC
TIONS"
1470 PRINT"(13) COLD-START POKE"
1480 PRINT"ENTER NUMBER:";:INPUT
 MAIN$
1490 IF VAL(MAIN$)<1 THEN1520
1500 IF VAL(MAIN$)>14 THEN1520
1510 RETURN
```

# The Professional Color Computer

## Enhancements for Productivity from HJL Products

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A self-contained numeric keypad for serious number-crunching. Besides the numbers, it has all the cursors, symbols and math keys, including autoshifted ADD and MULTIPLY. Includes cable and connectors for solderless installation.

**The Monitor Adapter - $25.95**

This universal driver works with all monochrome monitors. Easily installed without clips, jumpers or soldering (except some CoCo 2s with soldered-in video chips). Here's crisp, flicker-free monitor output with all the reliability you've come to expect from HJL Products.

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High-performance programming aid works with any CoCo that has 4 function keys. 26 one-touch BASIC statements, 10 user-defined macros at a time (save as many sets of macros as you like), auto line-numbering, instant screen dump to printer, and global search, make this software ideal for any BASIC programmer. Specify disk or cassette.

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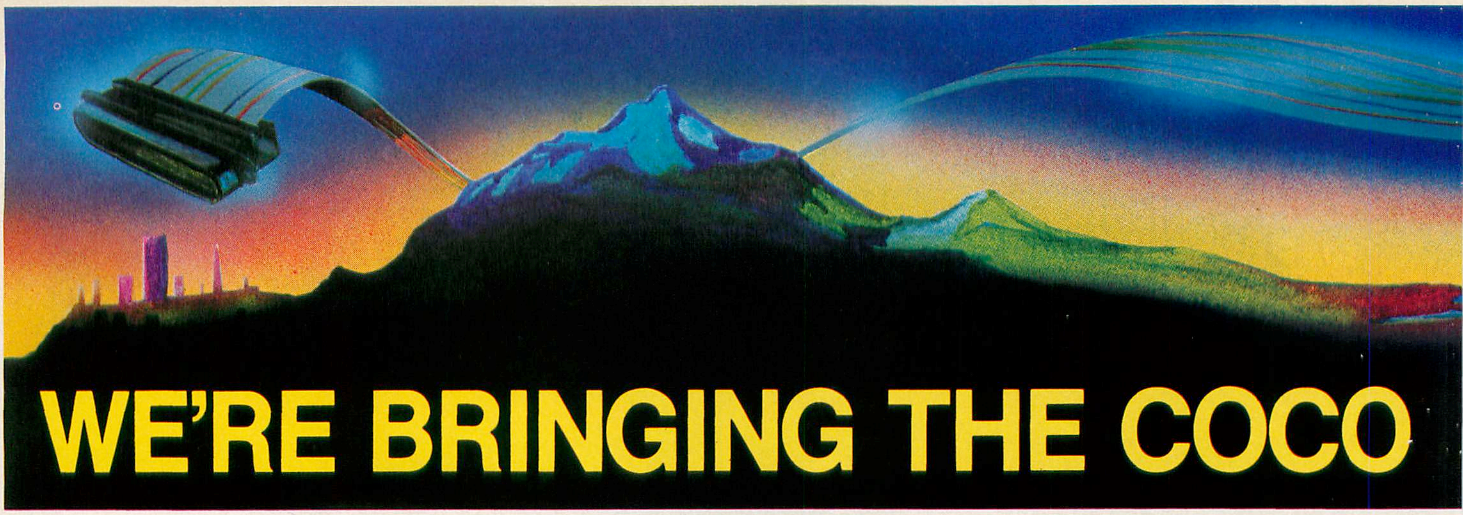

## RAINBOW'S BROADENING ITS SPECTRUM

THE RAINBOW and the Delphi Information Utility have joined together to allow CoCo owners all over the world to connect with one another!

Delphi is a full-service information utility. It offers everything from up-to-the-minute news stories from The Associated Press to electronic mail services. But, *best of all*, it now has **a special forum for Color Computer owners, and it's operated by the people who bring you THE RAINBOW each month.**

The CoCo Special Interest Group (SIG) features a variety of services, including an open forum where you can send and receive messages from Color Computer owners all over the world. It also has several databases to which you can upload your favorite programs and from which you can download programs written by other CoCo enthusiasts. Some of these databases are BASIC programming, OS-9 and home applications.

When setting up your account with Delphi, if you do not have a credit card or prefer not to use it, Delphi requires that you send $25 to give your account a positive balance. This will be refunded after your first free hour if you choose to no longer use the system or it will be applied to future connect charges. If you do not maintain a positive balance, you will be charged $3.50 each month for direct billing.

## PEEK INTO THE RAINBOW

The CoCo SIG's conference feature allows you to meet electronically with other members of the CoCo Community. You can join conferences with notables such as Dale Puckett, Cray Augsburg, Marty Goodman, Don Hutchison, Jim Reed, Lonnie Falk and others — on a regular basis. Conference schedules will appear in THE RAINBOW each month. Be sure to check online announcements for changes and additions.

## THE OTHER SIDE OF THE RAINBOW

**On Delphi, you also are able to buy RAINBOW ON TAPE** — order a whole set, or download an individual program immediately. You can also renew your RAINBOW subscription, make a fast and easy order for software or hardware from a multitude of vendors, or inquire about products on the CoCo SIG.

We also have a number of **programs that you can download** and use, just for the cost of the time you spend transferring them. There'll also be **corrections for RAINBOW articles**, helpful hints and many other useful features.

## FREE LIFETIME MEMBERSHIP

**THE RAINBOW is offering subscribers a free lifetime subscription to Delphi** — a $24.95 value — and a free hour of connect time — a $7.20 value at either 300, 1200 or 2400 Baud — so you can sample Delphi and the RAINBOW CoCo SIG. That's right. Your subscription to THE RAINBOW entitles you to this $32.15 value as a ***free bonus!***

**If you're not a RAINBOW subscriber**, just enter your order when you sign on with Delphi and you'll get the same great deal! For our $31 subscription fee, you'll get the finest Color Computer magazine ever, a free lifetime subscription to Delphi and a free hour of connect time.

## SAVE EVEN MORE

Want to save even more? While you're online you can order, for only $29.95, a deluxe package which includes the Delphi membership, the *Delphi Handbook and Command Card* ($21.95) and a total of three hours of connect time ($21.60).

Delphi provides us all with **Immediate CoCo Community**. Check it out today. After all, you can sample it for free!

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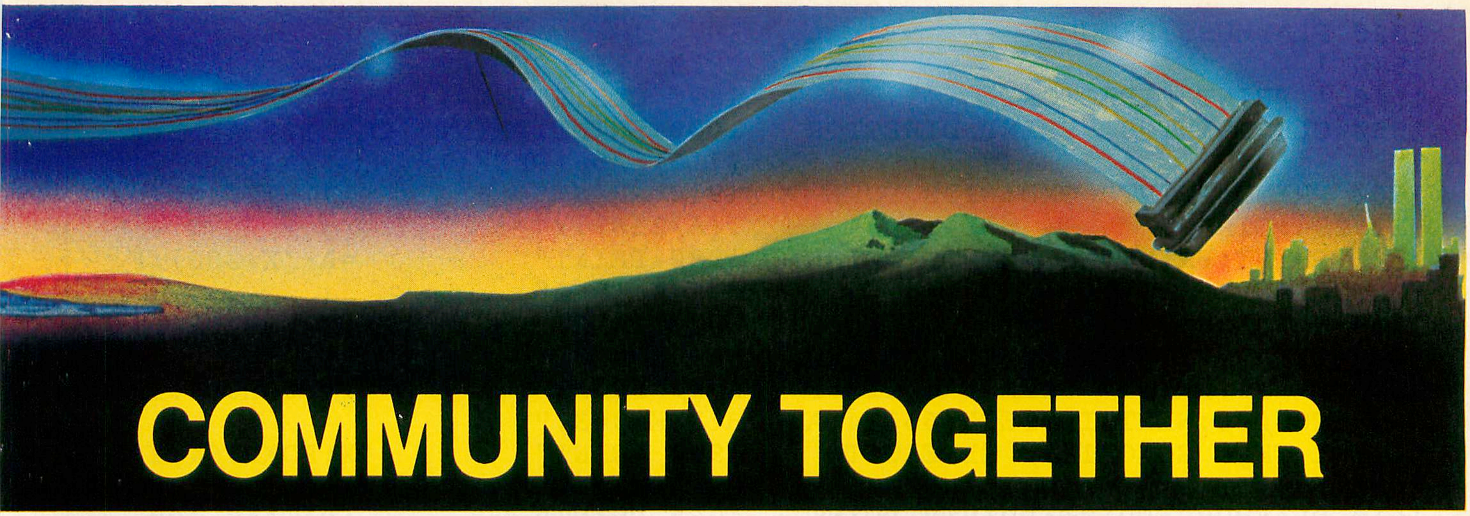
DELPHI

TYPE:
GROUP COCO



# COMMUNITY TOGETHER

## How to reach RAINBOW's Color Computer SIG . . .

There are several ways to connect to Delphi and THE RAINBOW's CoCo SIG. In most cities you will not even have to pay long distance charges; you can use special data communications networks like Telenet, Tymnet and the Canadian Datapac network.

First, set your terminal program to operate at either 300 or 1200 Baud (depending on the modem you have), and also select either 7 bits with even parity or 8 bits with no parity, and one stop bit. (If one combination doesn't work, try another.)

Decide which network you should use. There is no surcharge for Telenet or Tymnet. Canadian residents using Datapac will be charged an additional $10.80 (U.S.) per hour.

**On Telenet:** Uninet network has merged with Telenet. To get the Telenet number for your area, call (800) 336-0437. After you call the local access number and make connection, press ENTER twice. When the "TERMINAL=" prompt appears, press ENTER again. When the "@" prompt appears, type `C DELPHI` and press ENTER.

**On Tymnet:** Call (800) 336-0149 to get the Tymnet number for your area. After you dial your designated number and connect, you will see either "garbage" or a message saying "please type your terminal identifier." At this point, even if the screen is garbled, simply press 'A'. When "please log in:" appears, type `DELPHI` and press ENTER.

**From Canada (on Datapac):** Call Delphi Customer Service at (617) 491-3393 to get the Datapac number for your area. After you connect, press the period key (.) and ENTER (use two periods if you're using 1200 Baud). Type `SET 2:1, 3:126` and press ENTER. Now type `p 1 3106, DELPHI;` and press ENTER. Delphi's new rates indicate an additional $10.80 hourly surcharge for evening use of Datapac, which means a total of $18 (U.S.) for connect time.

**From other countries:** Many countries have their own data networks that can connect to either Telenet or Tymnet. Check with the telephone authorities in your country for details on how to sign up for this service. When you have an account set up, you can reach Delphi with a "host code" of 3110 6170 3088 through Telenet, or 3106 90 6015 through Tymnet. (You'll have to pay the toll charges for this connection.)

**Type in Your Username**

If you're already a subscriber to THE RAINBOW, at the "USERNAME:" prompt, type `JOINDELPHI` and press ENTER. At the "PASSWORD:" prompt, type `RAINBOW`. Then, at the "NUMBER:" prompt, type your individual subscription number from the mailing label of your latest issue of THE RAINBOW. (If there are one or more zeros at the beginning of this number, include them.)

**If you don't already have a subscription**, at the "USERNAME:" prompt, type `JOINDELPHI` and press ENTER. At the "PASSWORD:" prompt, type `SENDRAINBOW` and press ENTER. Have your MasterCard, VISA or American Express card ready, because you'll be led through a series of questions that will enable us to put your RAINBOW and Delphi subscriptions into effect. In an effort to hold down non-editorial costs, we do not bill for subscriptions.

If you make a typing error, just use Control-X and start over. Remember that at any point, when you're on Delphi, you can type `HELP` to get help on how to use the system. To get off the system just type `BYE`.

If you find that you're unable to log on to Delphi and enter the CoCo SIG after following these instructions, call us during afternoon business hours at (502) 228-4492. We'll be glad to offer assistance.

**Come Visit Us! Type:** `GROUP COCO`

After you sign in, you'll be prompted to set up your own, personal "user name" — Delphi is a friendly service, no numbers to remember — and you'll be asked a number of questions so Delphi can set up your account. You'll also be assigned a temporary password.

Delphi will tell you that your account will be ready after 6 p.m. the same day if you sign up before noon (Eastern time zone.) If not, your account will be ready at 6 p.m. the next day. Once an account is verified and opened, *each RAINBOW subscriber will be credited with an hour of free time!*

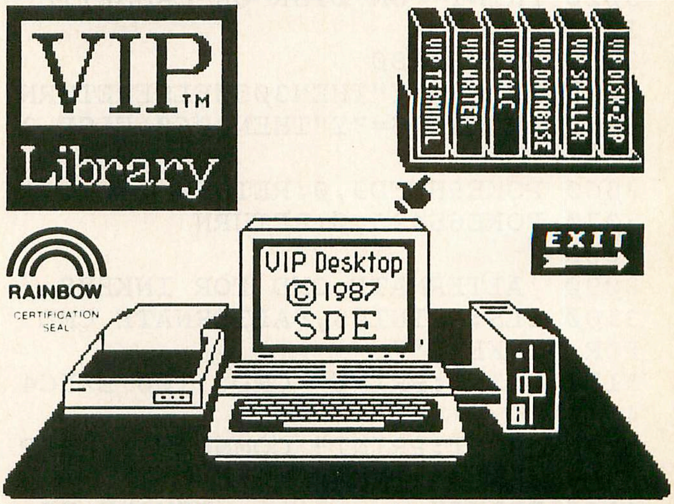
When you log back in, use your chosen username and your temporary password to access the system. At that point, you will meet Max, who will help you configure things and will change your temporary password into your own *personal* password. This is the password you will use for subsequent sessions — or until you change it.

After Max bids you goodbye, you'll wind up at the Delphi Main Menu; type in `GROUP COCO` and **join us on the CoCo SIG!**

```
1520 PLAYMUS$:RETURN
1530 '
1540 ' PRINT DIRECTORY
1550 CLS:PRINT@8,"PRINT DIRECTOR
Y"
1560 PRINT:PRINT" CMD: 100 POKE
111,254:DIR"
1570 PRINT:PRINT" COMMENTS: DISK
 BASIC ONLY"
1580 GOSUB3880
1590 IF A$="Y"THEN1600ELSERETURN
1600 PRINT:PRINT" PLEASE WAIT":F
ORX=1TO3000:NEXT:IF(PEEK(65314)A
ND1)=1 THEN GOTO 1610 ELSE GOTO
1640
1610 PLAYMUS$:PRINT:PRINT" PRINT
ER NOT READY"
1620 GOTO1580
1630 IF A$="Y" THEN1580ELSERETUR
N
1640 DIR:POKE111,254:DIR:PRINT:R
ETURN
1650 '
1660 ' PRINTER NOT READY PEEK
1670 CLS:PRINT@6,"PRINTER NOT RE
ADY PEEK"
1680 PRINT:PRINT" CMD: 100 IF (P
EEK(65314)AND1)=1";:
1690 PRINT"          THEN GOTO..
."
1700 PRINT:PRINT" COMMENTS: IF L
INE 100 RETURNS 1"
1710 PRINT"           PRINTER IS
 NOT READY"
1720 GOSUB3880
1730 IF A$="Y"THEN1740ELSERETURN
1740 PRINT:PRINT" PLEASE WAIT":F
ORX=1TO3000:NEXT:IF (PEEK(65314)
AND1)=1 THEN GOTO1750 ELSE GOTO1
760
1750 PLAYMUS$:PRINT:PRINT" PRINT
ER NOT READY":GOTO 1720
1760 PRINT:PRINT" PRINTER READY"
:GOTO 1720
1770 '
1780 ' PRINTER SCREEN MODE
1790 CLS:PRINT@4,"DISABLE THE RE
SET BUTTON"
1800 PRINT:PRINT" CMD: 100 POKE1
13,0"
1810 PRINT:PRINT" COMMENTS: RESE
T COMMAND"
1820 PRINT:PRINT" CMD: 100 POKE1
13,85"
1830 PRINT:PRINT" COLDSTARTS WHE
N RESET IS PUSHED"
1840 GOSUB3880
1850 IF A$="Y"THEN1860ELSERETURN
1860 POKE113,0:RETURN
```

```
1870 '
1880 'KEY REPEAT
1890 CLS:PRINT@11,"KEY REPEAT"
1900 PRINT:PRINT" CMD 100 A=PEEK
(116)*256+PEEK(1"
1910 PRINT"        17)-100:X=IN
T(A/256):Y"
1920 PRINT"         =A-(X*256):F
ORI=A TO A"
1930 PRINT"         +72:READB:PO
KEI,B:NEXT"
1940 PRINT"         I:POKE362,12
6:POKE363,"
1950 PRINT"         X:POKE364,Y:
CLEAR200,A"
1960 PRINT"        :DATA50,100,
52,20,189,"
1970 PRINT"         161,121,132,
127,52,2,1"
1980 PRINT"         89,161,193,1
42,4,254,1"
1990 PRINT"         89,167,211,1
82,1,83,12"
2000 PRINT"         9,191,38,37"
2010 PRINT
2020 PRINT" MORE. HIT ANY KEY";:
2030 A$=INKEY$:IF A$=""THEN2030
2040 CLS:PRINT"":PRINT" CMD 110
DATA53,22,150,255,129,"
2050 PRINT"         8,38,7,90,39
,31,48,31,"
2060 PRINT"         48,31,32,15,
129,32,37,"
2070 PRINT"         22,129,123,3
6,18,193,2"
2080 PRINT"         49,36,14,167
,128,92,18"
2090 PRINT"         9,162,130,52
,20,32,201"
2100 PRINT"         ,53,22,151,2
55,57,198,"
2110 PRINT"           1,32,251"
2120 PRINT:PRINT" COMMENTS: USE
<CLEAR> KEY TO"
2130 PRINT"          REPEAT THE
 KEY."
2140 GOSUB 3880
2150 IF A$="Y"THEN2160ELSERETURN
2160 GOTO170
2170 '
2180 CLS:PRINT:PRINT" KEY REPEAT
 IN EFFECT.":END
2190 '
2200 'PRINTER LINE WIDTH
2210 CLS:PRINT@5,"SET PRINTER LI
NE WIDTH"
2220 PRINT:PRINT" (1)  16 CPL"
2230 PRINT" (2)  32 CPL"
2240 PRINT" (3)  64 CPL"
```

```
2250 PRINT" (4) 132 CPL (DEFAULT
)"
2260 PRINT" (5) 255 CPL"
2270 PRINT" (6) EXIT TO MAIN MEN
U"
2280 PRINT:PRINT" ENTER NUMBER:"
:PRINT:PRINT" ALL MAY not BE COM
PATIBLE,":PRINT" CONSULT YOUR PR
INTER MANUAL";:
2290 A$=INKEY$:IF A$="" THEN2290
2300 IF VAL(A$)<1 THEN2330
2310 IF VAL(A$)>6 THEN2330
2320 GOTO2340
2330 PLAYMUS$:GOTO2190
2340 IF A$="1" THENGOSUB2410
2350 IF A$="2" THENGOSUB2470
2360 IF A$="3" THENGOSUB2530
2370 IF A$="4" THENGOSUB2590
2380 IF A$="5" THENGOSUB2650
2390 IF A$="6" THEN RETURN
2400 RETURN
2410 '16 CPL
2420 CLS:PRINT@5,"16 CHARACTERS
PER LINE"
2430 PRINT"":PRINT" CMD: 100 POK
E155,16"
2440 GOSUB3880
2450 IF A$="Y"THEN2460ELSERETURN
2460 POKE155,16:RETURN
2470 '32 CPL
2480 CLS:PRINT@5,"32 CHARACTERS
PER LINE"
2490 PRINT:PRINT" CMD: 100 POKE1
55,32"
2500 GOSUB3880
2510 IF A$="Y"THEN2520ELSERETURN
2520 POKE155,32:RETURN
2530 '64 CPL
2540 CLS:PRINT@5,"64 CHARACTERS
PER LINE"
2550 PRINT:PRINT" CMD: 100 POKE1
55,64"
2560 GOSUB3880
2570 IF A$="Y"THEN2580ELSERETURN
2580 POKE155,64:RETURN
2590 '132 CPL
2600 CLS:PRINT@4,"132 CHARACTERS
 PER LINE"
2610 PRINT:PRINT" CMD: 100 POKE1
55,132"
2620 GOSUB3880
2630 IF A$="Y"THEN2640ELSERETURN
2640 POKE155,132:RETURN
2650 '255 CPL
2660 CLS:PRINT@4,"255 CHARACTERS
 PER LINE"
2670 PRINT:PRINT" CMD: 100 POKE1
55,255"
2680 GOSUB3880
2690 IF A$="Y"THEN2700ELSERETURN
2700 POKE155,255:RETURN
2710 '
2720 'SET MAX MEMORY
2730 CLS:PRINT@7,"SET MAXIMUN ME
MORY"
2740 PRINT:PRINT" CMD: 100 POKE2
5,6:POKE26,1:"
2750 PRINT"               POKE1536,0:
NEW"
2760 PRINT:PRINT" USE BELOW POKE
 FOR DISK SYSTEMS"
2770 PRINT" CMD: 100 POKE25,14:P
OKE26,1:"
2780 PRINT"               POKE3584,0:
NEW
2790 PLAYMUS$:PRINT:PRINT" warni
ng WILL ERASE MEMORY!!!"
2800 PRINT" DOES NOT ALLOW USE O
F GRAPHICS"
2810 GOSUB3880
2820 IF A$="Y"THEN2830ELSERETURN
2830 IF PEEK(188)=14 THEN 2850
2840 CLS:PRINT:PRINT" CASS.SYSTE
M POKE CMD EXECUTED!":FORX=1TO20
00:NEXT:POKE25,6:POKE26,1:POKE15
36,0:NEW
2850 CLS:PRINT:PRINT" DISK SYSTE
```



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```
M POKE CMD EXECUTED!":FORX=1TO20
00:NEXT:POKE25,14:POKE26,1:POKE3
584,0:NEW
2860 '
2870 'SET HI-SPEED POKE
2880 CLS:PRINT@9,"HI-SPEED POKE"
2890 IF COCO$="Y"THEN2930
2900 PRINT:PRINT" CMD: 100 POKE6
5495,0"
2910 PRINT:PRINT" RESET POKE FOR
 ABOVE:"
2920 PRINT:PRINT" CMD: 100 POKE6
5494,0":GOTO2960
2930 PRINT:PRINT" CMD: 100 POKE&
HFFD9,0"
2940 PRINT:PRINT" RESET POKE FOR
 ABOVE:"
2950 PRINT:PRINT" CMD: 100 POKE&
HFFD8,0":GOTO2960
2960 PRINT:PRINT" COMMENTS: DOUB
LES RUNNING SPEED"
2970 PLAYMUS$
2980 PRINT" warning USING HI-SPE
ED HEATS"
2990 IF COCO$="Y"THEN3000:ELSE30
10
3000 PRINT" UP CHIPS.":GOTO3030
3010 PRINT" UP CHIPS, ALSO WILL
NOT WORK"
3020 PRINT" ON DISK OR CASSETTE
I/O"
3030 GOSUB3880
3040 IF A$="Y"THEN3050ELSERETURN
3050 IF COCO$="Y"THEN3060 ELSE 3
070
3060 POKE&HFFD9,0:RETURN
3070 POKE65495,0:RETURN
3080 '
3090 'ALTERNATE CMD FOR INKEY$
3100 CLS:PRINT@3,"ALTERNATE CMD
FOR 'INKEY$'"
3110 PRINT:PRINT" CMD: 100 EXEC4
4539"
3120 PRINT:PRINT" COMMENTS: HELP
FUL WHEN MAXIMUM"
3130 PRINT"             MEMORY IS
NEEDED"
3140 GOSUB3880
3150 IF A$="Y"THEN3160ELSERETURN
3160 CLS:PRINT:PRINT" 10 PRINT "
;:PRINT CHR$(34);:PRINT"HIT ANY
KEY.";:PRINT CHR$(34)
3170 PRINT" 20 EXEC44539"
3180 PRINT:PRINT" RUN"
3190 PRINT:PRINT" HIT ANY KEY."
3200 EXEC44539:RETURN
3210 '
3220 'SLOW KEYBOARD RESPONSE
3230 CLS:PRINT@4,"SLOW KEYBOARD
RESPONSE"
3240 PRINT:PRINT" CMD: 100 POKE2
83,X"
3250 PRINT:PRINT" X=5 TO 255, 5
IS THE FASTEST"
3260 PRINT:PRINT" RESET CMD FOR
ABOVE:"
3270 PRINT:PRINT" CMD: 100 POKE2
83,4"
3280 GOSUB3880
3290 IF A$="Y"THEN3300ELSERETURN
3300 PRINT:PRINT" ENTER X (5-255
) RECOMMEND 40      ":PRINT" 4 TO
RESET";:INPUT X
3310 IF X<4 OR X>255 THEN 3320 E
LSE 3330
3320 PLAYMUS$:GOTO3300
3330 POKE283,X:RETURN
3340 '
3350 'DISK OR CASS PEEK
3360 CLS:PRINT@5,"DISK OR CASSET
TE PEEK"
3370 PRINT:PRINT" CMD: 100 IF PE
EK(188)=14 THEN "
3380 PRINT:PRINT" IF LINE 100 RE
TURNS 14 = DISK"
3390 PRINT" IF LINE 100 RETURNS
06 = CASS"
3400 GOSUB3880
3410 IF A$="Y"THEN3420ELSERETURN
3420 IF PEEK(188)=14 THEN GOTO34
30 ELSE GOTO3440
3430 PRINT:PRINT" 14,YOU ARE USI
NG A DISK SYSTEM":FOR X=1 TO 400
0:NEXT:RETURN
3440 PRINT:PRINT" 6, YOU ARE USI
NG A CASSETTE":FOR X=1TO4000:NEX
T:RETURN
3450 '
3460 'DISK/DRIVE LIGHT
3470 CLS:PRINT@6,"DISK/DRIVE LIG
HT POKE"
3480 PRINT:PRINT" CMD: 100 POKE6
5344,X
3490 PRINT
3500 PRINT" IF X=1 THEN IT USES
DRIVE 0"
3510 PRINT" IF X=2 THEN IT USES
DRIVE 1"
3520 PRINT" IF X=4 THEN IT USES
DRIVE 2"
3530 PRINT" IF X=64 THEN IT USES
 DRIVE 3"
3540 PRINT" IF X=0 RESETS ABOVE
CMD'S"
3550 PRINT:PRINT" TURNS ON LIGHT
, DOES NOT "
3560 PRINT" EFFECT DISK/DRIVE MO
TOR"
```

```
3570 GOSUB3880
3580 IF A$="Y"THEN3590ELSERETURN
3590 IF PEEK(188)=6 THEN 3610
3600 GOTO3630
3610 PRINT" YOU HAVE A CASSETTE,
 TRY #10"
3620 PRINT" FROM MAIN MENU.":FOR
 X=1TO4000:NEXT:RETURN
3630 CLS:PLAYMUS$:PRINT:PRINT" W
ATCH LIGHT ON DRIVE #0":FOR X=1T
O4000:NEXT
3640 POKE65344,1:FOR X=1TO3000:N
EXT
3650 POKE65344,0:FOR X=1TO1000:N
EXT
3660 FOR X=1TO10
3670 POKE65344,1:FOR Y=1TO150:NE
XTY
3680 POKE65344,0:FOR Y=1TO100:NE
XTY:NEXT X
3690 PLAYMUS$:RETURN
3700 '
3710 'DISABLE ALL FUNCTIONS
3720 CLS:PRINT@6,"DISABLE ALL FU
NCTIONS"
3730 PRINT:PRINT" CMD: 100 POKE3
01,129:POKE302,"
3740 PRINT"               119"
3750 PRINT:PRINT" USE CMD BELOW
TO RESET"
3760 PRINT:PRINT" CMD: 100 POKE3
01,129:POKE302,60"
3770 PLAYMUS$:PRINT:PRINT" warni
ng SAVE PROGRAM BEFORE "
3780 PRINT" EXECUTING THIS COMMA
ND."
3790 PRINT" OR COPY DOWN THE RES
ET CMD."
3800 GOSUB3880
3810 IF A$="Y"THEN3820ELSERETURN
3820 CLS:PRINT:PRINT" ALL FUNCTI
ONS DISABLED"
3830 POKE301,129:POKE302,119
3840 PRINT:PRINT" TRY IT. TYPE '
LIST', AND VIEW"
3850 PRINT" THE PROGRAM IN MEMOR
Y, THEN"
3860 PRINT" TRY AND 'RUN' IT, OR
 'SAVE' IT"
3870 END
3880 A$="":PRINT:PRINT" EXECUTE?
 (Y/N, <ENTER> = N)";:
3890 A$=INKEY$:IF A$="" THEN 389
0 ELSE RETURN
3900 PMODE4,1:PCLS:SCREEN1,1
3910 GOTO310
```

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NEW FROM K-SOFT

### *Get help at tax time by organizing your income, expenses and banking accounts*

# The Home Financial Analyst

### By Daniel Piersma

Keeping track of your finances is very important in this day and age, and your Color Computer can help. I have seen several programs for home budgeting lately, but have not seen any that suited my particular needs. So, I went ahead and created my own. There were four things in particular I wanted to accomplish:

1) keep track of my income and expenses while staying balanced against my checking and savings account
2) calculate my income and expenses by account (or category), and project a budget from these accounts
3) keep an orderly record for filing an itemized 1040 income tax return (with check numbers or other information for proof of deductibility)
4) have provision for easy addition, deletion or correction of entries

To accomplish these requirements, I wrote two programs. The first program, *Home Financial Analyst*, keeps track of my income and expenses for a single month. The second program, *Yearly Report*, totals the monthly files together and gives a year-end (or part of the year) report and projects a monthly budget (adjusted for inflation, if you want). It also has an option to print out a form for planning your next month's budget. This is what budgeting is all about — being able to see how you have spent your money in the past and using this information to plan how you are going to use your money in the future.

**Running *Home Financial Anaylst***

Upon running Listing 1, `BUDGET`, you are asked to enter the month and year you will be working on (use numbers, not letters). After that, you just need to select a number off the screen to go to the function you want, as the program is menu-driven.

But there is one thing you must do at the beginning of each month — enter your cash balance (total of checking, savings, etc.) in Account 100 as your first entry. After that, do not use Account 100 for the rest of the month. I have set up the account numbers so that accounts 100 through 140 are income accounts, accounts 200 through 283 are non-taxable expenses, and accounts 300 through 340 are tax-deductible expenses. The list of account numbers can be found by using the file maintenance option on the screen.

This program runs like a database program, which means each transaction you enter is filed in memory with a file number attached to it. Each file will

```
------------------------------------------------------------------------------
                          BUDGET PLANNING FORM
------------------------------------------------------------------------------
BUDGET PLAN FOR .../.../...                BUDGET PLAN FOR .../.../...

100 CASH BALANCE          ..........       100 CASH BALANCE          ..........

110 EARNED INCOME         ..........       110 EARNED INCOME         ..........

120 INTEREST INCOME       ..........       120 INTEREST INCOME       ..........

130 MISC. TAXABLE INCOME  ..........       130 MISC. TAXABLE INCOME  ..........

140 NON-TAXABLE INCOME    ..........       140 NON-TAXABLE INCOME    ..........
------------------------------------------------------------------------------
200 FEDERAL WITHOLDING    ..........       200 FEDERAL WITHOLDING    ..........

201 FICA                  ..........       201 FICA                  ..........

202 STATE WITHOLDING      ..........       202 STATE WITHOLDING      ..........

203 LOCAL WITHOLDING      ..........       203 LOCAL WITHOLDING      ..........

210 GROCERY EXPENSE       ..........       210 GROCERY EXPENSE       ..........

220 WATER                 ..........       220 WATER                 ..........

230 MORTGAGE              ..........       230 MORTGAGE              ..........

240 GAS & ELECTRIC        ..........       240 GAS & ELECTRIC        ..........

250 TELEPHONE             ..........       250 TELEPHONE             ..........

260 CAR EXPENSE           ..........       260 CAR EXPENSE           ..........

270 INSURANCE             ..........       270 INSURANCE             ..........

280 HOUSE REPAIRS         ..........       280 HOUSE REPAIRS         ..........

281 ANNUITY               ..........       281 ANNUITY               ..........

282 MISC. EXPENSE         ..........       282 MISC. EXPENSE         ..........

283 LOAN PAYMENTS         ..........       283 LOAN PAYMENTS         ..........

300 MEDICAL EXPENSE       ..........       300 MEDICAL EXPENSE       ..........

310 CONTRIBUTIONS         ..........       310 CONTRIBUTIONS         ..........

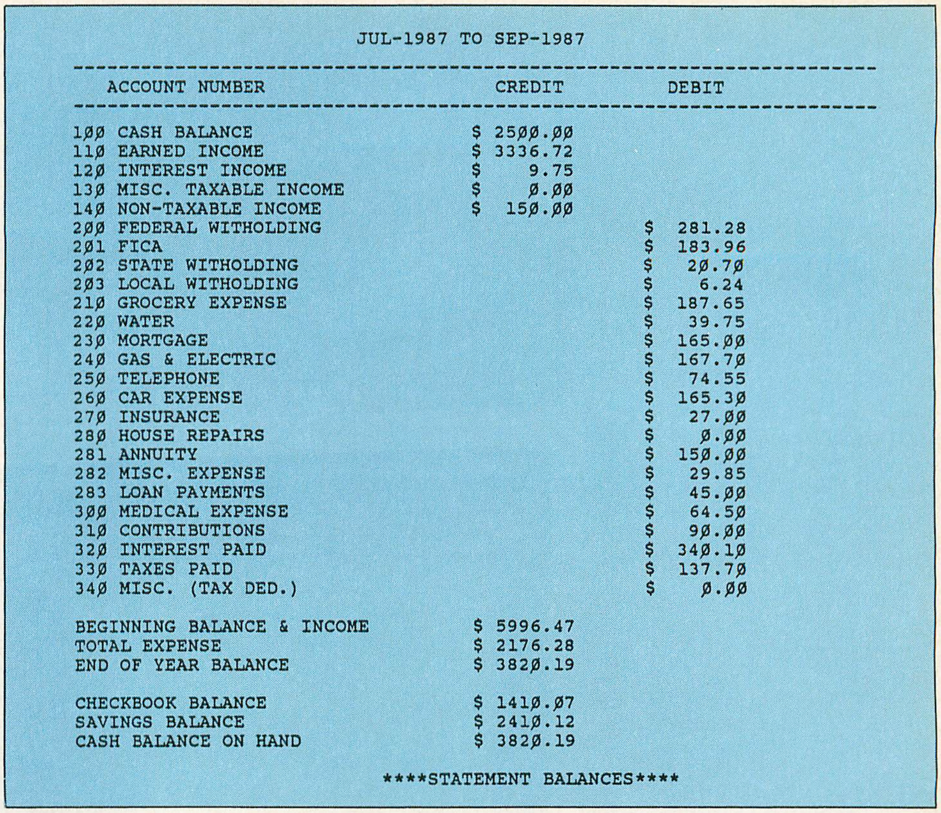
320 INTEREST PAID         ..........       320 INTEREST PAID         ..........

330 TAXES PAID            ..........       330 TAXES PAID            ..........

340 MISC. (TAX DED.)      ..........       340 MISC. (TAX DED.)      ..........
```

---

*Dan Piersma has an associate's degree in electronics and is currently employed as an electronic technician at a hospital in Evansville, Indiana. His wife, Michelle, is a registered nurse.*



```
                      JUL-1987 TO SEP-1987

   ------------------------------------------------------------------
   ACCOUNT NUMBER                            CREDIT          DEBIT
   ------------------------------------------------------------------
100 CASH BALANCE                          $ 2500.00
110 EARNED INCOME                         $ 3336.72
120 INTEREST INCOME                       $    9.75
130 MISC. TAXABLE INCOME                  $    0.00
140 NON-TAXABLE INCOME                    $  150.00
200 FEDERAL WITHOLDING                                      $  281.28
201 FICA                                                    $  183.96
202 STATE WITHOLDING                                        $   20.70
203 LOCAL WITHOLDING                                        $    6.24
210 GROCERY EXPENSE                                         $  187.65
220 WATER                                                   $   39.75
230 MORTGAGE                                                $  165.00
240 GAS & ELECTRIC                                          $  167.70
250 TELEPHONE                                               $   74.55
260 CAR EXPENSE                                             $  165.30
270 INSURANCE                                               $   27.00
280 HOUSE REPAIRS                                           $    0.00
281 ANNUITY                                                 $  150.00
282 MISC. EXPENSE                                           $   29.85
283 LOAN PAYMENTS                                           $   45.00
300 MEDICAL EXPENSE                                         $   64.50
310 CONTRIBUTIONS                                           $   90.00
320 INTEREST PAID                                           $  340.10
330 TAXES PAID                                              $  137.70
340 MISC. (TAX DED.)                                        $    0.00

BEGINNING BALANCE & INCOME                $ 5996.47
TOTAL EXPENSE                             $ 2176.28
END OF YEAR BALANCE                       $ 3820.19

CHECKBOOK BALANCE                         $ 1410.07
SAVINGS BALANCE                           $ 2410.12
CASH BALANCE ON HAND                      $ 3820.19

                   ****STATEMENT BALANCES****
```

have five pieces of information in it: date, account number, amount, check number (or savings account) and any comments you may want to enter. By setting up the information by files, you can easily recall it from memory for editing or deletion. This also makes it possible to have a search function, which lets you search for dates, individual accounts, amount spent, or a check number.

The monthly program will generate three reports, which can be printed either to a printer or to the computer screen:

1) a report of each account number
2) a report of all account total dollar amounts, with a grand total matched against your checking and savings accounts
3) a report of each data file in numerical order (to aid in error detection and correction)

The program will save your files to, and load them from, disk upon selection from the menu. Use care when saving a file. The disk file titles are set up by the date you are working with; if you work on a month that already has a disk file created, trying to save new information may erase the old file. Also, if you load a file from disk or break the program and start over, all the files that were in the computer's memory will be gone. You will have to start from scratch if you haven't saved your information to disk.

One other thing I do is designate my checks for separate accounts. For example, I write one check for my mortgage, putting the interest in Account 320 and the principal in Account 230. This way, the interest is under a tax-deductible account, but both can still be referenced by the proper check.

**Running *Yearly Report***

The report program is very simple to run and assumes you have your data files loaded in Drive 0 when you start. Just load and run Listing 2, `REPORT`. Enter the starting and ending dates. The program will ask if you want a budget planning form, which is a printout to be used to plan your budget. You are then asked for a cost of living factor, which will be used to print out a projected budget.

The budget figures are calculated by taking the total value for each account and dividing it by the number of months. Then it is multiplied by your cost of living factor and a report is generated. The report program will take quite a bit of time to load and calculate all your transactions.

**Variables and Strings**

The program listings have remark statements that will help you follow the program operation. Listed below are most of the strings and variables and what they are used for in the program:

| **Expression** | **Function** |
|---|---|
| `A$(C) - E$(C)` | Data fields |
| `BA$ - BF$` | Data field descriptions |
| `M$,AD$` | Month and account descriptions |
| `AN$` | Account numbers |
| `MM,MM$,` | Creates dates |
| `YY,YY$` | Used in reports and disk files |
| `TITLE$` | Used for naming disk data files |
| `H` | H=0 print to screen/ H=1 print to printer |
| `W` | Width of data fields |
| `U,I,D,CB` | Used in calculating income, expense and balance |
| `CH,SA,BA` | Checkbook and savings balances and total |

Here are a few program tips you might find helpful. Line 14 sets the printer speed at 1200 baud, and there are several places where a `CHR$(12)` is used to form feed reports. You may need to modify these to get the program to run with your printer. To change account descriptions, just change the `DATA` statements at the end of the program. To add or delete accounts, you must change the numbers for `AD$` and `AN$` in Line 10, change all values of `Y` used in the program, and add or delete `DATA` statements at the end of the program. Remember to change both program listings when you do this.

If you want to change the width of your data fields, you can change the value of `W` in Line 14 of `BUDGET`. You may need to change the tabs in the printer routines if you do this, though. If you need to expand the number of transactions per month, just change the numbers for `A$` through `E$` in Line 10 and clear 50 bytes of memory for as many files as you increase — and remember to do this to both programs.

I hope you find this program useful in helping save money on taxes and managing your money better. I think the next project will be to modify this program to keep a running balance of my checking and savings accounts. That's what a computer is for, to do our work for us. Right?

---

*(Questions or comments regarding this program may be directed to the author at 1414 Thompson Ave., Evansville, IN 47715. Please enclose an SASE when writing for a reply.)* ☐

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Folder
Disk
Programs in folder 3
Calendar
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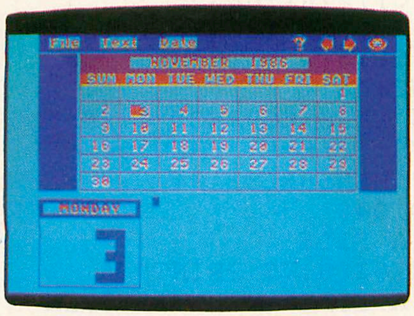

NOVEMBER 1986

| SUN | MON | TUE | WED | THU | FRI | SAT |
|---|---|---|---|---|---|---|
| | | | | | | 1 |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| 23 | 24 | 25 | 26 | 27 | 28 | 29 |
| 30 | | | | | | |

MONDAY
3

### DeskMate 3™ seven-in-one software

Best of all, we've got a low-priced software package that may be all you ever need: DeskMate 3 (26-3262, $99.95). It's easy to use because there are no complicated commands to memorize, and the program itself actually guides you along with prompts at each step.

DeskMate 3 is an integrated program including *Text* word processing, a general-purpose text-entry and editing program. *Text* performs search and replace, file merge, and block select, copy and delete. *Ledger* is a simple spreadsheet which includes an easy-to-use menu and automatic column formatting. *Index Cards* filing comes in handy as a personal filing system—it actually eliminates mounds of paperwork and records. *Index Cards* also allows you to enter and edit data and perform sorts and searches. Using *Paint,* you can create colorful charts, graphs and designs. *Calendar* is a simple monthly planner that allows you to list "to do's" for any date. *Calculator* has four functions for quick and easy calculations. With the included *Telecom* telecommunications program, you can access national information banks or send messages to other computers.

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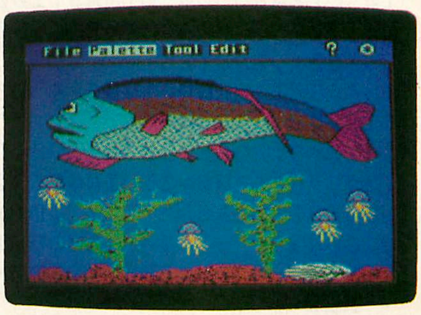

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|  |  |  |  |
|---|---|---|---|
| 30 | 58 | 298 | 178 |
| 58 | 222 | 338 | 37 |
| 110 | 40 | 368 | 39 |
| 140 | 91 | 400 | 117 |
| 184 | 181 | 442 | 193 |
| 224 | 225 | END | 216 |
| 266 | 148 |  |  |

**Listing 1:** BUDGET

```
2 '*HOME FINANCIAL ANALYST*
4 '* 4/85 BY DAN PIERSMA   *
5 '*   32K-ECB & 1 DISK    *
6 GOTO448
8 'DIMENSION DATAFILES & DESCRIP
TIONS
10 CLEAR5500:DIMA$(100),B$(100),
C$(100),D$(100),E$(100),M$(12),A
D$(25),AN$(25)
12 'SET BAUD 1200 & DEFINE NONVA
RIABLE STRINGS
14 W=8:POKE150,41:V$=" "+STRING$
(30,"*"):U$=STRING$(72,"-"):W$=C
HR$(32):BA$=" DAY (DD) ":BB$=" A
CCOUNT# ":BC$=" AMOUNT   ":BD$="
 CHECK #  ":BE$=" COMMENTS ":BF$
="REC #"
16 'ENTER DATE
18 CLS:PRINT@9,"BUDGET MANAGER":
PRINT"ENTER MONTH AND YEAR THAT
YOU   WILL BE ENTERING DATA ON.
":INPUT"MONTH (MM) ";MM:INPUT"Y
EAR (YYYY) ";YY$
20 IFMM<1ORMM>12THEN18
22 YY=VAL(YY$):IFYY<1984ORYY>198
8THEN18
24 'READ DESCRIPTIONS
26 FORM=1TO12:READM$(M):NEXT:FOR
AD=1TO25:READAD$(AD):NEXT
28 'CREATE DISK FILE TITLE
30 MM$=M$(MM):TITLE$=MM$+"-"+YY$
32 L=LEN(TITLE$)/2:Z=207-L
34 'CREATE MAIN MENU
36 H=0:CLS:PRINT@9,"BUDGET MANAG
ER":PRINT"      SELECT A NUMBER
1-5"
38 PRINT@128,V$:PRINT" 1> FILE M
AINTENANCE":PRINT" 2> SEARCH FIL
E":PRINT" 3> GENERATE REPORTS":P
RINT" 4> SAVE FILE":PRINT" 5> LO
AD FILE":PRINTV$
40 L$=INKEY$
42 L=VAL(L$):IFL<1ORL>5THEN40
44 ONL GOTO48,212,276,392,420
46 'FILE MAINTENANCE MENU
48 CLS3:PRINT@32,"        SELECT
A NUMBER 1-4":PRINT@160,V$:PRINT
" 1> ADD AN ENTRY":PRINT" 2> DEL
ETE AN ENTRY":PRINT" 3> EDIT OR
VIEW A FILE":PRINT" 4> LIST CHAR
T OF ACCOUNTS":PRINT" R> RETURN
TO MAIN MENU":PRINTV$
50 L$=INKEY$:IFL$="R"THENGOTO36
52 L=VAL(L$):IFL<1ORL>4THEN50
54 ONL GOTO58,112,128,200
56 'ADD A FILE
58 CLS:PRINT@11,"ADD A FILE":GOS
UB452:PRINT@136,"FILE NUMBER: "C
+1:PRINT
60 PRINTBA$":";:LINEINPUTA$(C)
62 IFLEN(A$(C))<(W)THENA$(C)=A$(
C)+W$ELSE66
64 GOTO62
66 PRINTBB$":";:LINEINPUTB$(C)
68 IFLEN(B$(C))<(W)THENB$(C)=B$(
C)+W$ELSE72
70 GOTO68
72 PRINTBC$":";:LINEINPUTC$(C)
74 IFLEN(C$(C))<(W)THENC$(C)=C$(
C)+W$ELSE78
76 GOTO74
78 PRINTBD$":";:LINEINPUTD$(C)
80 IFLEN(D$(C))<(W)THEND$(C)=D$(
C)+W$ELSE84
82 GOTO80
84 PRINTBE$":";:LINEINPUTE$(C)
86 IFLEN(E$(C))<(W*2)THENE$(C)=E
$(C)+W$ELSE90
88 GOTO86
90 IFLEN(A$(C))>(W)THEN58
92 IFLEN(B$(C))>(W)THEN58
94 IFLEN(C$(C))>(W)THEN58
96 IFLEN(D$(C))>(W)THEN96
98 IFLEN(E$(C))>(W*2)THEN58
100 X=C:GOSUB446
102 PRINT"IS THIS CORRECT <Y/N>"
104 L$=INKEY$:IFL$="Y"THEN108
106 IFL$="N"THEN58ELSE104
108 C=C+1:GOTO48
110 'DELETE A FILE
112 CLS:PRINT@128,V$:PRINT" *
    DELETE A FILE        *":PRIN
T" * PRESS <R> TO RETURN TO MENU
*":PRINT" *      OR <C> TO CONTIN
UE      *":PRINTV$
114 L$=INKEY$:IFL$="C"THEN118
116 IFL$="R"THEN36ELSE114
118 INPUT"RECORD # TO BE DELETED
 :";D
120 FORX=(D-1)TOC-1
122 A$(X)=A$(X+1):B$(X)=B$(X+1):
C$(X)=C$(X+1):D$(X)=D$(X+1):E$(X
)=E$(X+1)
124 NEXTX:CLS:PRINT@232,"FILE DE
LETED":FORT=1TO800:NEXTT:C=C-1:G
OTO36
126 'EDIT A FILE
128 CLS:GOSUB452:PRINT:INPUT" EN
```

```
TER FILE NUMBER :";E:X=E-1:IF(X)
>(C)THEN128ELSEGOSUB446
130 PRINT"    EDIT WHICH FIELD
<1-5>":PRINT"     OR PRESS <R> T
O RETURN"
132 L$=INKEY$:IFL$=""THEN132
134 IFL$="R"THEN36
136 L=VAL(L$):IFL<1ORL>5THENGOTO
132
138 ONL GOTO140,156,166,176,186
140 PRINTBA$":";:LINEINPUTA$(X)
142 IFLEN(A$(X))<(W)THENA$(X)=A$
(X)+W$ELSE146
144 GOTO142
146 IFLEN(A$(X))>(W)THEN128ELSE1
48
148 GOSUB446
150 PRINT"IS THIS CORRECT <Y/N>"
152 L$=INKEY$:IFL$="Y"THEN36
154 IFL$="N"THEN130ELSE152
156 PRINTBB$":";:LINEINPUTB$(X)
158 IFLEN(B$(X))<(W)THENB$(X)=B$
(X)+W$ELSE162
160 GOTO158
162 IFLEN(B$(X))>(W)THEN128ELSE1
64
164 GOSUB446:GOTO150
166 PRINTBC$":";:LINEINPUTC$(X)
168 IFLEN(C$(X))<(W)THENC$(X)=C$
(X)+W$ELSE172
170 GOTO168
172 IFLEN(C$(X))>(W)THEN128ELSE1
74
174 GOSUB446:GOTO150
176 PRINTBD$":";:LINEINPUTD$(X)
178 IFLEN(D$(X))<(W)THEND$(X)=D$
(X)+W$ELSE182
180 GOTO178
182 IFLEN(D$(X))>(W)THEN128ELSE1
84
184 GOSUB446:GOTO150
186 PRINTBE$":";:LINEINPUTE$(X)
188 IFLEN(E$(X))<(W*2)THENE$(X)=
E$(X)+W$ELSE192
190 GOTO188
192 IFLEN(E$(X))>(W*2)THEN128ELS
E194
194 GOSUB446:GOTO150
196 GOTO48
198 'LIST CHART OF ACCOUNTS
200 CLS0:PRINT@192,"DO YOU WANT
A HARD COPY <Y/N> ?"
202 L$=INKEY$:IFL$="Y"THEN206
204 IFL$="N"THEN208ELSE202
206 PRINT#-2,"LIST OF ACCOUNTS":
FORY=1TO25:PRINT#-2,AD$(Y):NEXTY
:GOTO36
208 CLS:PRINT@7,"CHART OF ACCOUN
```

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```
TS":FORY=1TO25:PRINTAD$(Y):FORT=
1TO500:NEXTT:NEXTY:GOTO36
210 'SEARCH FUNCTION
212 CLS:PRINT"        SEARCH FUN
CTION"
214 PRINT"DO YOU WANT A HARD COP
Y <Y/N>"
216 H$=INKEY$:IFH$="N"THEN224
218 IFH$="Y"THEN220ELSE216
220 H=1
222 IFH=1THENGOSUB440
224 LINEINPUT"DATA TO LOOK FOR:"
;T$
226 IFLEN(T$)<(W)THENT$=T$+W$ELS
E230
228 GOTO226
230 PRINT:PRINT"SELECT FIELD TO
SEARCH"
232 PRINT" 1> ";BA$:PRINT" 2> ";
BB$:PRINT" 3> ";BC$:PRINT" 4> ";
BD$:PRINT" R> RETURN TO MAIN MEN
U"
234 L$=INKEY$:IFL$=""THEN234
236 IFL$="R"THEN36
238 L=VAL(L$)
240 IFL<1ORL>4THEN234ELSE242
242 ONL GOTO244,254,258,262
244 FORX=0TOC-1:IFA$(X)=T$THENGO
SUB266ELSE246
246 NEXTX
248 CLS:PRINT@232,"NO MORE FILES
":FORT=1TO800:NEXTT
250 IFH=1THENPRINT#-2,CHR$(12)
252 GOTO36
254 FORX=0TOC-1:IFB$(X)=T$THENGO
SUB266ELSE256
256 NEXTX:GOTO248
258 FORX=0TOC-1:IFC$(X)=T$THENGO
SUB266ELSE260
260 NEXTX:GOTO248
262 FORX=0TOC-1:IFD$(X)=T$THENGO
SUB266ELSE264
264 NEXTX:GOTO248
266 IFH=1THENGOSUB270ELSE272
268 RETURN
270 PRINT#-2,A$(X)TAB(10)B$(X)TA
B(20)"$"C$(X)TAB(30)D$(X)TAB(40)
E$(X)TAB(59)X+1:RETURN
272 GOSUB446:FORT=1TO800:NEXTT:R
ETURN
274 'REPORT SETUP & MENU
276 CLS0:PRINT@192,"DO YOU WANT
A HARD COPY <Y/N> ?"
278 L$=INKEY$:IFL$="Y"THENH=1:GO
TO282
280 IFL$="N"THEN282ELSE278
282 CLS3:PRINT"        REPORT GE
NERATION":PRINT@160,V$:PRINT" 1>
 REPORT FOR EACH ACCOUNT #":PRIN
T" 2> REPORT OF ACCOUNT TOTALS":
PRINT" 3> REPORT OF ALL TRANSACT
IONS       (OR LIST ALL FILES BY
#)":PRINT" R> RETURN TO MAIN MEN
U":PRINTV$
284 FORY=1TO25:AN$(Y)=MID$(AD$(Y
),1,3):NEXTY
286 L$=INKEY$:IFL$="R"THEN36
288 L=VAL(L$):IFL<1ORL>3THEN286
290 ONL GOTO294,338,386
292 'REPORT EACH ACCOUNT
294 IFH=1THENGOSUB440:PRINT#-2
296 FORY=1TO25
298 IFH=1ANDY=6THENGOSUB308:GOTO
310
300 IFH=1ANDY=10 THENGOSUB308:GO
TO310
302 IFH=1ANDY=17THENGOSUB308:GOT
O310
304 IFH=1ANDY=21THENGOSUB308:GOT
O310
306 GOTO310
308 PRINT#-2,CHR$(12):GOSUB440:P
RINT#-2:RETURN
310 IFH=1THENPRINT#-2,TAB(22)AD$
(Y)
312 FORX=0TOC-1
314 IFAN$(Y)=MID$(B$(X),1,3)THEN
316ELSE322
316 IFH=1THENGOSUB266
318 IFH=0THENGOSUB272
320 U=U+VAL(C$(X))
322 NEXTX:IFU=0THEN324ELSE328
324 IFH=1THENPRINT#-2
326 GOTO332
328 IFH=1THENPRINT#-2,"TOTAL FOR
 ACCOUNT"TAB(20):PRINT#-2,USING"
$#####.##";U:PRINT#-2:U=0
330 IFH=0THENPRINT"TOTAL FOR ACC
OUNT ";AN$(Y);" $"U:U=0:FORT=1TO
1000:NEXTT
332 NEXTY:IFH=1THENPRINT#-2,CHR$
(12)
334 GOTO36
336 'CHART OF ACCOUNTS
338 IFH=1THENPRINT#-2,TAB(25)TIT
LE$;" CHART OF ACCOUNTS":PRINT#-
2:PRINT#-2,U$:PRINT#-2,"ACCOUNT
#"TAB(32)"CREDIT"TAB(52)"DEBIT":
PRINT#-2,U$
340 INPUT"ENTER CHECKBOOK BALANC
E";CH:INPUT"ENTER SAVINGS BALANC
E   ";SA:BA=SA+CH
342 CLS:FORY=1TO5:V=30:GOSUB348
344 I=U+I:U=0:NEXTY
346 V=50:GOTO360
348 FORX=0TOC-1
350 IFAN$(Y)=MID$(B$(X),1,3)THEN
U=U+VAL(C$(X))
352 NEXTX
354 IFH=1THENPRINT#-2,AD$(Y)TAB(
V):PRINT#-2,USING"$#####.##";U
356 IFH=0THENPRINTAN$(Y);" $";U
358 RETURN
360 FORY=6TO25:GOSUB348
```

```
362 D=D+U:U=0:NEXTY
364 CB=I-D:IFH=0THEN366ELSE374
366 PRINT"TOTAL INCOME       $";I
:PRINT"TOTAL EXPENSE      $";D:PR
INT"CASH BALANCE       $";CB:PRIN
T
368 PRINT"CHECKBOOK BALANCE $";C
H:PRINT"SAVINGS BALANCE    $";SA:
PRINT"CASH BALANCE       $";BA
370 IFINT(BA)=INT(CB)THENPRINT"
******STATEMENT BALANCES******"E
LSEPRINT"??DOES NOT BALANCE PLEA
SE REDO??"
372 FORT=1TO1000:NEXTT:GOTO382
374 IFH=1THENPRINT#-2:PRINT#-2,"
TOTAL CREDITS"TAB(30):PRINT#-2,U
SING"$#####.##";I:PRINT#-2,"LESS
 TOTAL DEBITS"TAB(30):PRINT#-2,U
SING"$#####.##";D:PRINT#-2,"CASH
 BALANCE"TAB(30):PRINT#-2,USING"
$#####.##";CB:PRINT#-2
376 PRINT#-2,"CHECKBOOK BALANCE"
TAB(30):PRINT#-2,USING"$#####.##
";CH:PRINT#-2,"PLUS SAVINGS BALA
NCE"TAB(30):PRINT#-2,USING"$####
#.##";SA:PRINT#-2,"CASH BALANCE"
TAB(30):PRINT#-2,USING"$#####.##
";BA:PRINT#-2
378 IFINT(CB)=INT(BA)THENPRINT#-
2,TAB(20)"*****STATEMENT BALANCE
S*****"ELSEPRINT#-2,TAB(20)"??TO
TALS DO NOT ADD PLEASE REDO??"
380 PRINT#-2,CHR$(12)
382 D=0:I=0:GOTO36
384 'LIST OF DATA FILES
386 IFH=1THENGOSUB440:GOTO442
388 FORX=0TOC-1:GOSUB446:FORT=1T
O950:NEXTT:NEXTX:GOTO36
390 'SAVE TO DISK
392 CLS3:PRINT@192," INSERT DATA
 DISK IN DRIVE #0 ":PRINT" PRESS
 <C> TO CONTINUE OR <R>    TO RE
TURN TO MAIN MENU.         "
394 L$=INKEY$:IFL$="C"THEN398
396 IFL$="R"THEN36ELSE394
398 PRINT"SAVE TO DISK-ARE YOU S
URE <Y/N>"
400 L$=INKEY$:IFL$="Y"THENGOTO40
4
402 IFL$="N"THENGOTO36ELSE400
404 CLS:PRINT@140,"SAVING":PRINT
@Z,TITLE$:PRINT@267,"DATA FILE"
406 OPEN"O", #1, TITLE$
408 X=0
410 IFA$(X)=""THEN416
412 WRITE#1,A$(X),B$(X),C$(X),D$
(X),E$(X)
414 X=X+1:GOTO410
416 CLOSE#1:GOTO36
418 'LOAD FROM DISK
420 CLS3:PRINT@192," INSERT DATA
 DISK IN DRIVE #0":PRINT" PRESS
 <C> TO LOAD DATA OR <R>  TO RET
URN TO MAIN MENU."
422 L$=INKEY$:IFL$="C"THEN426
424 IFL$="R"THENGOTO36ELSE422
426 CLS:PRINT@140,"LOADING":PRIN
T@Z,TITLE$:PRINT@267,"DATA FILE"
428 OPEN "I", #1, TITLE$
430 X=0
432 INPUT #1,A$(X),B$(X),C$(X),D
$(X),E$(X):X=X+1
434 IFEOF(1)=-1THEN436ELSE432
436 CLOSE #1:C=X:N=C:GOTO36
438 'PRINTER SUBROUTINE
440 PRINT#-2,TAB(32)TITLE$:PRINT
#-2,U$:PRINT#-2,BA$TAB(10)BB$TAB
(20)BC$TAB(30)BD$TAB(40)BE$TAB(5
9)BF$:PRINT#-2,U$:RETURN
442 FORX=0TOC-1:PRINT#-2,A$(X)TA
B(10)B$(X)TAB(20)"$"C$(X)TAB(30)
D$(X)TAB(40)E$(X)TAB(59)X+1:NEXT
X:PRINT#-2,CHR$(12):GOTO36
444 'PRINTER SUBROUTINE
446 CLS:PRINT"     THIS IS FILE
NUMBER "X+1:PRINT:PRINTA$(X):PRI
NTB$(X):PRINTC$(X):PRINTD$(X):PR
INTE$(X):RETURN
448 PCLEAR1:GOTO10
450 'DATA OVERFLOW SUBROUTINE
452 PRINT" FIRST 4 ENTRIES ARE L
IMITED TO  8 CHARACTERS EACH, AN
D COMMENTS ARE LIMITED TO 16 CHA
RACTERS.":RETURN
454 'DATA DESCRIPTIONS
456 DATA JAN,FEB,MAR,APR,MAY,JUN
,JUL,AUG,SEP,OCT,NOV,DEC,100 CAS
H BALANCE,110 EARNED INCOME,120
INTEREST INCOME,130 MISC. TAXABL
E INCOME,140 NON-TAXABLE INCOME,
200 FEDERAL WITHOLDING,201 FICA,
202 STATE WITHOLDING,203 LOCAL W
ITHOLDING
458 DATA 210 GROCERY EXPENSE,220
 WATER,230 MORTGAGE,240 GAS & EL
ECTRIC,250 TELEPHONE,260 CAR EXP
ENSE,270 INSURANCE
460 DATA 280 HOUSE REPAIRS,281 A
NNUITY,282 MISC. EXPENSE,283 LOA
N PAYMENTS,300 MEDICAL EXPENSE,3
10 CONTRIBUTIONS,320 INTEREST PA
ID,330 TAXES PAID,340 MISC. (TAX
 DED.)
```

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| | |
|---|---|
| 30 | 188 |
| 68 | 61 |
| 102 | 183 |
| 130 | 15 |
| 150 | 59 |
| 170 | 22 |
| END | 123 |

**Listing 2:** REPORT

```
2 '* YEARLY REPORT PROGRAM    *
4 '*      FOR USE WITH        *
6 '* HOME FINANCIAL ANALYST *
8 '*  4/85 BY DAN PIERSMA     *
10 GOTO184
12 'DIMENSION DATAFILES & DESCRI
PTIONS
14 CLEAR5500:DIMA$(100),B$(100),
C$(100),D$(100),E$(100),M$(12),A
D$(25),AN$(25),AN(25)
16 'SET BAUD 1200 & DEFINE NONVA
RIABLE STRINGS
18 POKE150,41:U$=STRING$(80,"-")
:BG$=STRING$(10,"."):BP$="BUDGET
 PLAN FOR .../.../..."
20 'READ DESCRIPTIONS
22 FORM=1TO12:READM$(M):NEXT:FOR
Y=1TO25:READAD$(Y):NEXT
24 'ENTER DATES
26 CLS:PRINT@9,"ANNUAL REPORT":P
RINT:PRINT" ENTER BEGINNING MONT
H AND YEAR  AND ENDING MONTH AND
 YEAR"
28 PRINT:PRINTV$:INPUT" BEGINNIN
G MONTH (MM) ";BM:INPUT" BEGINNI
NG YEAR (YYYY)";BY$:INPUT" ENDIN
G MONTH    (MM) ";EM:INPUT" ENDI
NG YEAR    (YYYY)";EY$
30 EY=VAL(EY$):BY=VAL(BY$)
32 IFBM<1ORBM>12THEN26
34 IFEM<1OREM>12THEN26
36 IFBY<1984ORBY>1988THEN26
38 'CREATE REPORT TITLE
40 IFEY<(BY)OREY>1988THEN26
42 RTITLE$=M$(BM)+"-"+BY$+" TO "
+M$(EM)+"-"+EY$
44 IFEM<(BM)THENEM=(EM)+12
46 'PRINT BUDGET PLANNING FORM
48 CLS:PRINT@163,"WOULD YOU LIKE
 TO PRINT A        BUDGET PLANNIN
G FORM <Y/N>"
50 L$=INKEY$:IFL$="Y"THEN54
52 IFL$="N"THEN76ELSE50
54 CLS:PRINT@201,"HARDCOPY ONLY"
:PRINT"IF PRINTER IS READY PRESS
 <P>   PRESS <C> TO SKIP TO REPO
RTS"
56 L$=INKEY$:IFL$="C"THEN76
58 IFL$="P"THEN60ELSE56
60 CLS:PRINT@204,"PRINTING":PRIN
T"      BUDGET PLANNING FORM"
62 PRINT#-2,U$:PRINT#-2,TAB(28)"
BUDGET PLANNING FORM":PRINT#-2,U
$:PRINT#-2:PRINT#-2,BP$TAB(40)BP
$:PRINT#-2
64 FORY=1TO5:GOSUB70:NEXTY
66 PRINT#-2,U$:PRINT#-2
68 FORY=6TO25:GOSUB70:NEXTY:GOTO
72
70 PRINT#-2,AD$(Y)TAB(25)BG$TAB(
40)AD$(Y)TAB(65)BG$:PRINT#-2:RET
URN
72 PRINT#-2,CHR$(12)
74 'GENERATE REPORTS
76 CLS0:PRINT@160,"        REPORT
 GENERATION":PRINT"PRINT HARD CO
PY REPORTS <Y/N> ?":PRINT"    PRE
SS <E> TO END PROGRAM"
78 L$=INKEY$:IFL$="Y"THENH=1:GOT
O84
80 IFL$="N"THEN84
82 IFL$="E"THENENDELSE78
84 INPUT"ENTER COST OF LIVING RA
TE FOR   BUDGET PROJECTIONS IN %
";I:I=(I/100)+1
86 INPUT"ENTER CHECKBOOK BALANCE
";CH:INPUT"ENTER SAVINGS BALANCE
  ";SA:BA=SA+CH
88 FORY=1TO25:AN$(Y)=MID$(AD$(Y)
,1,3):NEXTY
90 TITLE$=M$(BM)+"-"+BY$:GOSUB17
2:FORX=0TOC-1:IFAN$(1)=MID$(B$(X
),1,3)THEN92ELSE94
92 AN(1)=VAL(C$(X))
94 NEXTX
96 FORYY=(BM)TO(EM)
98 IFYY>12THEN100ELSE102
100 S=(YY)-12:TITLE$=M$(S)+"-"+E
Y$:GOTO104
102 TITLE$=M$(YY)+"-"+BY$
104 GOSUB172:CLS:PRINT@195,"CALC
ULATING ACCOUNT TOTALS"
106 FORY=2TO25
108 FORX=0TOC-1
110 IFAN$(Y)=MID$(B$(X),1,3)THEN
AN(Y)=AN(Y)+VAL(C$(X))ELSE112
112 NEXTX:NEXTY:NEXTYY
114 IFH=0THEN116ELSE118
116 FORY=1TO25:PRINTAD$(Y):PRINT
USING"$#####.##";AN(Y):FORT=1TO9
00:NEXTT:NEXTY:GOTO124
118 PRINT#-2,TAB(30)RTITLE$:PRIN
T#-2:PRINT#-2,U$:PRINT#-2,TAB(3)
"ACCOUNT NUMBER"TAB(37)"CREDIT"T
AB(52)"DEBIT":PRINT#-2,U$:PRINT#
-2
120 FORY=1TO5:PRINT#-2,AD$(Y)TAB
(35):PRINT#-2,USING"$#####.##";A
N(Y):NEXTY
```

```
122 FORY=6TO25:PRINT#-2,AD$(Y)TA
B(50):PRINT#-2,USING"$#####.##";
AN(Y):NEXTY
124 FORY=1TO5:TI=AN(Y)+TI:NEXTY
126 FORY=6TO25:TE=AN(Y)+TE:NEXTY
128 CB=TI-TE:IFH=0THEN130ELSE140
130 CLS:PRINT@160,"TOTAL INCOME
         $";TI:PRINT"TOTAL EXPEN
SE          $";TE:PRINT"YEAR END
CASH BALANCE $";CB
132 PRINT"CHECKBOOK BALANCE
$";CH:PRINT"SAVINGS BALANCE
  $";SA:PRINT"TOTAL CASH ON HAND
     $";BA
134 IFINT(BA)=INT(CB)THEN136ELSE
138
136 PRINT" ******STATEMENT BALAN
CES******":FORT=1TO1500:NEXTT:GO
TO154
138 PRINT"STATEMENT OUT OF BALAN
CE - REDO":END
140 PRINT#-2:PRINT#-2,"BEGINNING
 BALANCE & INCOME"TAB(35):PRINT#
-2,USING"$#####.##";TI:PRINT#-2,
"TOTAL EXPENSE"TAB(35):PRINT#-2,
USING"$#####.##";TE
142 PRINT#-2,"END OF YEAR BALANC
E"TAB(35):PRINT#-2,USING"$#####.
##";CB
144 PRINT#-2:PRINT#-2,"CHECKBOOK
 BALANCE"TAB(35):PRINT#-2,USING"
$#####.##";CH:PRINT#-2,"SAVINGS
BALANCE"TAB(35):PRINT#-2,USING"$
#####.##";SA:PRINT#-2,"CASH BALA
NCE ON HAND"TAB(35):PRINT#-2,USI
NG"$#####.##";BA
146 IFINT(BA)=INT(CB)THEN148ELSE
150
148 PRINT#-2:PRINT#-2,TAB(27)"**
**STATEMENT BALANCES****":PRINT#
-2,CHR$(12):GOTO154
150 IFH=1THENPRINT#-2,"********S
TATEMENT DOES NOT BALANCE. PLEAS
E FIND YOUR ERROR AND REDO******
**":END
152 'FORMULATE BUDGET PROJECTION
S
154 A=(EM)-(BM-1)
156 FORY=2TO25:AN(Y)=AN(Y)/A:AN(
Y)=AN(Y)*I:NEXTY
158 IFH=0THEN160ELSE162
160 CLS:PRINT"MONTHLY BUDGET PRO
JECTIONS":FORY=2TO25:PRINTAD$(Y)
:PRINTUSING"$#####.##";AN(Y):FOR
T=1TO900:NEXTT:NEXTY:GOTO168
162 PRINT#-2,TAB(28)"MONTHLY BUD
GET PROJECTIONS":PRINT#-2:PRINT#
-2,U$:PRINT#-2,TAB(3)"ACCOUNT NU
MBER"TAB(37)"CREDIT"TAB(52)"DEBI
T":PRINT#-2,U$:PRINT#-2
164 FORY=2TO5:PRINT#-2,AD$(Y)TAB
(35):PRINT#-2, USING"$#####.##";
AN(Y):NEXTY
166 FORY=6TO25:PRINT#-2,AD$(Y)TA
B(50):PRINT#-2, USING"$#####.##"
;AN(Y):NEXTY:PRINT#-2:PRINT#-2,"
MULTIPLIED BY"I" FOR RISE IN COS
T OF LIVING":PRINT#-2,CHR$(12)
168 END
170 'LOAD FILES FROM DISK SUBROU
TINE
172 FORX=0TOC-1:A$(X)="":B$(X)="
":C$(X)="":D$(X)="":E$(X)="":NEX
TX:CLS:PRINT@140,"LOADING":PRINT
@203,TITLE$:PRINT@267,"DATA FILE
"
174 OPEN "I", #1, TITLE$
176 X=0
178 INPUT #1,A$(X),B$(X),C$(X),D
$(X),E$(X):X=X+1
180 IFEOF(1)=-1THEN182ELSE178
182 CLOSE #1:C=X:RETURN
184 PCLEAR1:GOTO14
186 DATA JAN,FEB,MAR,APR,MAY,JUN
,JUL,AUG,SEP,OCT,NOV,DEC,100 CAS
H BALANCE,110 EARNED INCOME,120
INTEREST INCOME,130 MISC. TAXABL
E INCOME,140 NON-TAXABLE INCOME,
200 FEDERAL WITHOLDING,201 FICA,
202 STATE WITHOLDING,203 LOCAL W
ITHOLDING
188 DATA 210 GROCERY EXPENSE,220
 WATER,230 MORTGAGE,240 GAS & EL
ECTRIC,250 TELEPHONE,260 CAR EXP
ENSE,270 INSURANCE
190 DATA 280 HOUSE REPAIRS,281 A
NNUITY,282 MISC. EXPENSE,283 LOA
N PAYMENTS,300 MEDICAL EXPENSE,3
10 CONTRIBUTIONS,320 INTEREST PA
ID,330 TAXES PAID,340 MISC. (TAX
 DED.)
```

*One-Liner Contest Winner . . .*

Run *Picoco* to see a "modern art generator."

**The listing:**

```
0 PMODE3:SCREEN1,1:PCLS:FOR R=1T
O10:X=RND(256):Y=RND(192):X1=RND
(256):Y1=RND(192):X2=RND(256):Y2
=RND(192):PX=(X+X1+X2)/3:PY=(Y+Y
1+Y2)/3:PC=RND(4):LINE(X,Y)-(X1,
Y1),PSET:LINE-(X2,Y2),PSET:LINE-
(X,Y),PSET:PAINT(PX,PY),PC,0:NEX
TR:FORW=1TO500:NEXTW:GOTO0
```

*Lonny Guilford*
*Lompoc, CA*

(For this winning one-liner contest entry, the author has been sent copies of both *The Second Rainbow Book of Simulations* and its companion *The Second Rainbow Simulations Tape.*)

*A utility to make color selection easier*

# PALETTEable Color Mixing

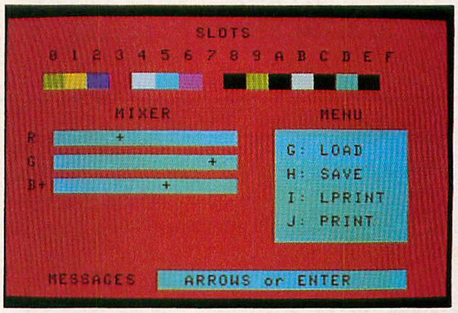
### By H. Allen Curtis

Decisions, decisions, decisions. The CoCo 3 offers a "palette" of 64 colors from which you can select up to 16 for your graphics masterpieces, and that's a selection often difficult to make. To facilitate decision making, I wrote the program *Colormix*.

*Colormix* is a color editor that aids your selection process by mixing colors to your prescription. Also, it provides a screen or hard copy printout of your color selections, saves them to disk or tape, and loads them back from disk or tape for emendation. The saved selections are recorded in BASIC program form, ready for merging with a larger program.

*Colormix* selects its colors via a "color mixer," which consists of three "color-meters." Each of the colors (red, green and blue) has one meter, referred to as the R, G or B meter. There are four values (0, 1, 2 and 3) on each of the scales of the three color meters. Since each color meter provides four color values, the three meters together provide a total of 64 color combinations (4*4*4 = 64).

The shades of color vary from dark to light as they progress from the low to the high ends of the color meters. Each color meter controls the amount of intensity of its color red, green or blue — to be used in the selected color combination.



ARROWS or ENTER

*Colormix* was written for use with an RGB monitor. After you have typed the listing and saved it, run *Colormix* to produce a Mode 2 (320-by-192 resolution, 16-color) screen. At the top of the screen are 16 slots containing the standard colors resulting from the execution of `PALETTE RGB`. Below the slots on the left is the color mixer and on the right is a command menu. At the bottom of the screen is a message board to prompt you in the proper operation of *Colormix*.

---

*H. Allen Curtis lives in Williamsburg, Virginia. He is interested in 17th and 18th century history and enjoys biking through the colonial capital. He balances past and present with his computer work.*

The initial message on the board is "0-9" or "A-J." The color slots are numbered in hexadecimal from 0 to F, with A, B, C, D, E and F representing 10, 11, 12, 13, 14 and 15, respectively. The commands on the menu board — Load, Save, Lprint and Print — are labelled G, H, I and J, respectively.

The initial message means you can press one of the number keys 0 through 9 or letter keys A through F to send the color in the corresponding slot to the mixer. The message also means you may alternatively select one of the menu commands by pressing a key from G to J. Pressing any key other than 0 through 9 or A through J results in the sounding of a short blast of a beep alarm.

Suppose you press a number key, say 2. Blue, the color in Slot 2, will be sent to the mixer. The colors of both the menu and message board will also change to blue. The message board will then read `ARROWS` or `ENTER`. The color mixer is cursor-controlled by means of the arrow keys. ENTER is pressed after the color mixing has been accomplished to your satisfaction.

You will see a plus (+) symbol on each of the three color meters, which serves as the cursor for that meter. A fourth plus located immediately to the left of the R meter indicates which of the three meter cursors is active.

For the color blue in the mixer, the R meter cursor moves to its leftmost position corresponding to the lowest R meter color intensity value, 0. Pressing the right arrow key moves the R meter cursor one position and changes the color in the mixer. After pressing the right arrow key a total of three times, you will find the cursor at its rightmost position, corresponding to the highest R meter color intensity value, 3; it will have passed through positions corresponding to intensity values 1 and 2. Likewise, pressing the left arrow key moves the cursor left from high to low intensity value positions while causing associated color changes.

The up and down arrow keys serve to determine which of the color meters has an active cursor. Pressing the down arrow key transfers cursor active control from the R meter to the G meter. Pressing the right and left arrow keys actuates the G meter cursor in the same manner as it did for the R meter. Pressing the up arrow key returns cursor control to the R meter, and pressing the down arrow key gives the B meter cursor control. Again, the right and left arrow keys move the active cursor in corresponding directions. Pressing the right or left arrow key when the cursor is in its rightmost or leftmost position, respectively, produces no cursor movement.

After you have experimented with cursor movement and have obtained a color in the mixer to your liking, press ENTER. Suppose the R, G and B meter cursors were in positions corresponding to the values 0, 1 and 1, respectively — Color 3 would be transferred to Slot 2. You will be informed of this fact via an auxiliary message board just below the mixer. The message on the main board will read 0 through 9 or A through J once again.

You will note that the color in Slot D has also changed to Color 3. The reason for the change is that the color in Slot D has been used in *Colormix* to paint the mixer, menu and message boards. *Colormix* also uses the colors in slots E and F for all printing and coloring of the screen's background, respectively.

Even though the color in Slot D changes with every color change in the mixer, *Colormix* remembers the last color selected for Slot D. To verify this, press the D key; the color green will be sent both to the mixer and to Slot D itself. You may select a new color for Slot D and press ENTER or press ENTER alone to retain green as the color for Slot D.

The auxiliary message board refers to Slot D by its decimal designation, 13. The hexadecimal designations were given to the last six slots for the purpose of having single-key selection of each slot.

Changing the colors of slots E and F will also change the print and background colors, respectively. Selecting Slot E turns the mixer, menu and message boards black, effectively erasing all printing on the menu and message boards. Pressing the right arrow key will quickly make the printing in the menu and message boards visible again. Black in Slot E seems to yield the best printing clarity. For aesthetic purposes, you may want to alter the background color of the screen by mixing a new color for Slot F.

When the message board reads 0 through 9 or A through J, you may, by pressing J, obtain a screen printout of the present contents of slots 0 through F. The printed information appears on the auxiliary message board for one slot at a time. The main message board tells you to press ENTER to receive information for each succeeding slot. When you terminate the program by pressing BREAK, you automatically get a full text screen printout of all 16 slots. You may be greeted with a beep the first time you press BREAK, but repeated pressing of the key will indeed stop the program.

| Slot | Color | RGB |
|---|---|---|
| 0 | 34 | 210 |
| 1 | 54 | 330 |
| 2 | 15 | 113 |
| 3 | 36 | 300 |
| 4 | 63 | 333 |
| 5 | 31 | 133 |
| 6 | 41 | 203 |
| 7 | 42 | 212 |
| 8 | 0 | 000 |
| 9 | 18 | 030 |
| 10 | 6 | 110 |
| 11 | 27 | 033 |
| 12 | 0 | 000 |
| 13 | 18 | 030 |
| 14 | 0 | 000 |
| 15 | 38 | 310 |

**Table 1**

```
4 HSCREEN2
5 DIMC(15):FORI=0TO15:READC
(I):PALETTEI,C(I):NEXT
6 DATA 34,54,15,36,63,31,41,
42,0,18,6,27,0,18,0,38
```

**Table 2**

For a hard copy printout of the slot information, merely press I. Table 1 shows a sample printout. If your printer is not connected, a program hang-up will occur; this can be eliminated by pressing BREAK. In such a case, you will have a screen printout as a consolation. If you don't have a printer, change the number `660` in Line 480 to `650`. Pressing I will then produce a beep instead of a hang-up.

Pressing H allows you to save the current slot information in BASIC program form (ASCII format). A sample listing of such a recording is shown in Table 2. The saving process differs depending on whether you have a disk or cassette system.

### Saving to Disk

On disk systems, pressing H causes the prompt `FILENAME:` to be printed on the message board. Answer the prompt by entering a filename of eight characters or less. The information will immediately be recorded on disk in the designated file. Instead of typing a filename, you may merely press ENTER.

If you have *not* previously loaded any

slot information, the current slot information will be recorded on disk in a file named SLOTCOLS. On the other hand, if in the present session with *Colormix* you have loaded from a previously saved file, you will record the current information in that file; that is, you will overwrite the most recently loaded file. All saved files automatically have the extension .DAT appended to the filename.

If an I/O Error occurs during recording, *Colormix* won't be terminated. Instead, I-O ERROR is printed on the message board. Moments later, the message will be replaced with 0 through 9 or A through J.

**Saving to Cassette**

On cassette systems, pressing H also causes the prompt FILENAME: to be printed on the message board. Position the tape in your recorder before you answer the prompt, then respond by typing a filename of up to eight characters but do *not* press ENTER yet. First, press both the Record and Play buttons on your recorder, and then press ENTER. When the recording is complete, the prompt will be replaced with 0 through 9 or A through J. If you fail to type in a filename and instead just press ENTER, the prompt will be replaced momentarily with the message NEED FILENAME.

**Loading from Disk**

To load a previously saved file, press G. The prompt FILENAME: is then printed on the message board. Answer the prompt by entering a filename of up to eight characters. If the program cannot find that file in the disk directory, the prompt is replaced with the message ILLEGAL FILENAME. If you merely press ENTER without typing a filename, the message NEED FILENAME appears on the screen for a short time.

*Colormix* responds to a correct filename by loading the designated file. You will see the slot colors change during loading. When loading is complete, the messages 0 through 9 or A through J return to the message board. An I/O Error is treated as it was for a save.

**Loading from Cassette**

Pressing G brings the prompt FILENAME: to the message board. You may respond by pressing ENTER. Position the tape for loading the desired file, then press the Play button on the recorder to start loading the file. You will see the slot colors change during the loading. When loading is finished, the messages 0 through 9 or A through J return to the message board.

You may type a full filename of an already saved file and press ENTER instead of just pressing ENTER alone. However, if you type an incorrect filename, a fruitless search for the file could ensue.

After acquainting yourself with the operation of *Colormix*, you should find that slot color selection is not only "PALETTE"able but also easy and timesaving. ☐

✓

| | | | |
|---|---|---|---|
| 100 | 171 | 590 | 207 |
| 200 | 221 | 700 | 36 |
| 360 | 32 | 840 | 237 |
| 450 | 153 | END | 169 |

**The listing:** COLORMIX

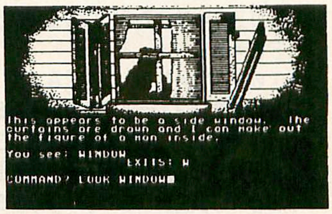
```
5 CLEAR500
10 REM ****  COLORMIX  ****
20 REM BY H. ALLEN CURTIS
30 REM COPYRIGHT (C) 1986
40 ON ERR GOTO930
50 ON BRK GOTO970
60 DIMS(15),R(15),G(15),B(15),Q(
63)
70 S(0)=18:S(1)=54:S(2)=9:S(3)=3
6:S(4)=63:S(5)=31:S(6)=45:S(7)=3
8:S(8)=0:S(9)=18:S(10)=0:S(11)=6
3:S(12)=0:S(13)=18:S(14)=0:S(15)
=38
80 R(0)=6:G(0)=18:B(0)=6:R(1)=18
:G(1)=18:B(1)=6:R(2)=6:G(2)=6:B(
2)=18:R(3)=18:G(3)=6:B(3)=6:R(4)
=18:G(4)=18:B(4)=18:R(5)=10:G(5)
=18:B(5)=18:R(6)=18:G(6)=6:B(6)=
18:R(7)=18:G(7)=10:B(7)=6
90 R(8)=6:G(8)=6:B(8)=6:R(9)=6:G
(9)=18:B(9)=6:R(10)=6:G(10)=6:B(
10)=6:R(11)=18:G(11)=18:B(11)=18
:R(12)=6:G(12)=6:B(12)=6:R(13)=6
:G(13)=18:B(13)=6:R(14)=6:G(14)=
6:B(14)=6:R(15)=18:G(15)=10:B(15
)=6
100 PALETTERGB:HSCREEN2:HCLS15
110 HCOLOR14:HPRINT(17,1),"SLOTS
":FORI=0TO9:HPRINT(4+2*I,3),CHR$
(I+48):NEXT:FORI=10TO15:HPRINT(4
+2*I,3),CHR$(I+55):NEXT
120 DATA 0,1,8,9,2,3,10,11,16,17
,24,25,18,19,26,27,4,5,12,13,6,7
,14,15,20,21,28,29,22,23,30,31,3
2,33,40,41,34,35,42,43,48,49,56,
57,50,51,58,59,36,37,44,45,38,39
,46,47,52,53,60,61,54,55,62,63
130 FORI=0TO3:FORJ=0TO3:FORK=0TO
3:READC(I,J,K):NEXTK,J,I
140 DATA 0,1,10,11,100,101,110,1
11,2,3,12,13,102,103,112,113,20,
21,30,31,120,121,130,131,22,23,3
2,33,122,123,132,133
150 DATA 200,201,210,211,300,301
,310,311,202,203,212,213,302,303
,312,313,220,221,230,231,320,321
,330,331,222,223,232,233,322,323
,332,333
160 FORI=0TO63:READQ(I):NEXT
170 FORI=0TO15:HCOLORI
180 HLINE(16*I+28,40)-(16*I+44,5
0),PSET,BF:NEXT
190 HCOLOR14:HPRINT(2,10),"R":HP
RINT(2,12),"G":HPRINT(2,14),"B":
HPRINT(10,8),"MIXER":HPRINT(28,8
),"MENU
200 HCOLOR13
210 FORJ=0TO2
220 FORI=0TO3
```

```
230 HLINE(36+I*32,79+J*16)-(68+I
*32,88+J*16),PSET,BF
240 NEXTI,J
250 HLINE(192,78)-(287,153),PSET
,BF:HCOLOR14:HPRINT(25,11),"G: L
OAD":HPRINT(25,13),"H: SAVE":HPR
INT(25,15),"I: LPRINT":HPRINT(25
,17),"J: PRINT"
260 GOSUB870:GOSUB880
270 K$=INKEY$:IFK$=""THEN270
280 D=ASC(K$)-48:IFD>22 AND D<27
THEN GOSUB480:GOTO260
290 IFD<0 OR D>22 THENGOSUB650:G
OTO270
300 IFD>9 THEND=D-7:IFD<10 THEN2
70
310 RC=R(D):GC=G(D):BC=B(D):GOSU
B470:RR=10:HPRINT(RC,10),"+":HPR
INT(GC,12),"+":HPRINT(BC,14),"+"
:HCOLOR14:HPRINT(3,10),"+":HCOLO
R14
320 GOSUB870:GOSUB890
330 K$=INKEY$:IFK$=""THENGOSUB47
0:GOTO330
340 IFASC(K$)=9 AND RR=10 AND RC
<18 THENGOSUB760:RC=RC+4:HPRINT(
RC,RR),"+"
350 IFASC(K$)=8 AND RR=10 AND RC
>6 THENGOSUB760:RC=RC-4:HPRINT(R
C,RR),"+"
360 IFASC(K$)=9 AND GR=12 AND GC
<18 THENGOSUB770:GC=GC+4:HPRINT(
GC,GR),"+"
370 IFASC(K$)=8 AND GR=12 AND GC
>6 THENGOSUB770:GC=GC-4:HPRINT(G
C,GR),"+"
380 IFASC(K$)=9 AND BR=14 AND BC
<18 THENGOSUB780:BC=BC+4:HPRINT(
BC,BR),"+"
390 IFASC(K$)=8 AND BR=14 AND BC
>6 THENGOSUB780:BC=BC-4:HPRINT(B
C,BR),"+"
400 IFASC(K$)=10 AND GR=12 THEN
GR=0:BR=14:HCOLOR15:HPRINT(3,12)
,"+":HCOLOR14:HPRINT(3,14),"+"
410 IFASC(K$)=10 AND RR=10 THEN
RR=0:GR=12:HCOLOR15:HPRINT(3,10)
,"+":HCOLOR14:HPRINT(3,12),"+"
420 IFASC(K$)=94 AND GR=12 THEN
GR=0:RR=10:HCOLOR15:HPRINT(3,12)
,"+":HCOLOR14:HPRINT(3,10),"+"
430 IFASC(K$)=94 AND BR=14 THEN
BR=0:GR=12:HCOLOR15:HPRINT(3,14)
,"+":HCOLOR14:HPRINT(3,12),"+"
440 K=ASC(K$):IFK<>9 AND K<>8 AN
D K<>10 AND K<>94 AND K<>13 THEN
GOSUB650
450 IFASC(K$)=13THENRR=10:HCOLOR
```

SUNDOG SYSTEMS

In Quest of the Star★Lord

A new animated graphic adventure for the Color Computer 3 from the author of the Hall of the King trilogy! Enjoy the mixture of science and fantasy as you quest for the Phoenix Crossbow, the only thing that can save you in the post-holocaust world. A full 4 disk sides of adventure! Outstanding 320x200 graphics will make this your favorite CoCo adventure! Req. 128K CoCo 3 and disk drive. Only $34.95.



This appears to be a side window. The
curtains are drawn and I can make out
the figure of a man inside.

You see: WINDOW
EXITS: W

COMMAND? LOOK WINDOW

WHITE FIRE OF ETERNITY

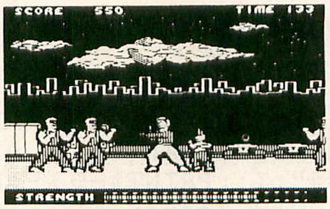
64K Animated Graphic Adventure. See 12/86 Rainbow review. Only $19.95.

Kung-Fu Dude

An exciting new arcade game. This is the long-awaited response to the huge demand for a Kung-Fu program for the CoCo. The graphics, sound effects, and animation are spectacular! This is the BEST karate game ever available for the Color Computer. Req. 64K, disk drive, and joystick. Only $24.95.

"The CoCo karate gap has been filled and Kung-Fu Dude does it excellently. I highly recommend (it)!" –2/88 Rainbow review

"A definite 5 stars!" –12/87 Wizard's Castle review



CHAMPION

64K Superhero Action Adventure. See 5/87 Rainbow review. Only $19.95.

All programs CoCo 1, 2, 3 compatible unless stated otherwise.

Sundog Systems

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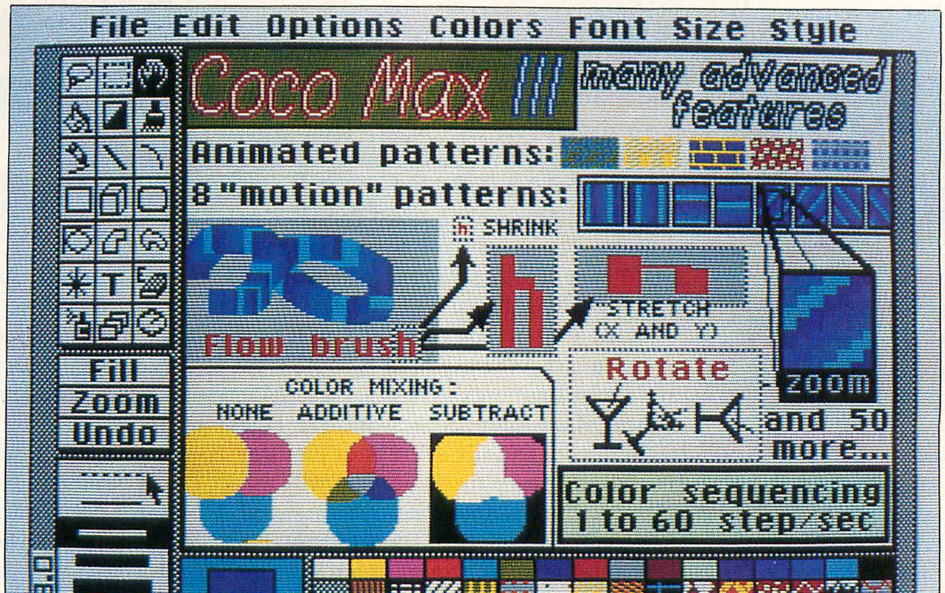
```
13:HPRINT(RC,10),"+":HPRINT(GC,1
2),"+":HPRINT(BC,14),"+":HCOLOR1
5:HPRINT(3,10),"+":HPRINT(3,12),
"+":HPRINT(3,14),"+":HCOLOR14,15
:GR=0:BR=0:PALETTED,CC:S(D)=CC E
LSE330
460 HCOLOR13:HLINE(36,132)-(157,
163),PSET,BF:HCOLOR14:HPRINT(8,1
7),"SLOT "+STR$(D):HPRINT(8,19),
"COLOR"+STR$(CC):R(D)=RC:G(D)=GC
:B(D)=BC:GOTO260
470 CC=C((RC-6)*.25,(GC-6)*.25,(
BC-6)*.25):PALETTE13,CC:RETURN
480 ON D-22 GOTO 490,590,660,700
490 O=0:GOSUB790
500 IFPEEK(&HBC)=6THENJ=-1ELSEJ=
1
510 F$=A$
520 IFA$="" AND J=1 THENGOSUB870
:GOSUB910:GOTO490
530 OPEN"I",#J,F$
540 I=0
550 IF EOF(J)=-1THEN570
560 LINE INPUT#J,A$:GOTO550
570 CLOSE#J:A$=RIGHT$(A$,LEN(A$)
-6)+",":FORI=0TO15:D=VAL(LEFT$(A
$,INSTR(A$,",")-1)):S(I)=D:PALET
TEI,D:A$=RIGHT$(A$,LEN(A$)-INSTR
(A$,",")):L=INT(Q(D)/100):R(I)=L
*4+6:E=Q(D)-100*L
580 L=INT(E/10):G(I)=L*4+6:L=E-1
0*L:B(I)=L*4+6:NEXT:RETURN
590 IFPEEK(&HBC)=6THENJ=-1:O=1:M
OTORON ELSEJ=1:O=0
600 GOSUB790:IFA$="" AND F$="" T
HENF$="SLOTCOLS"ELSE IFA$<>""THE
NF$=A$
610 A$="6 DATA "
620 FORI=0TO15:A$=A$+RIGHT$(STR$
(S(I)),LEN(STR$(S(I)))-1)+",":NE
XT:A$=LEFT$(A$,LEN(A$)-1)
630 OPEN"O",#J,F$
640 PRINT#J,"4 HSCREEN2":PRINT#J
,"5 DIMC(15):FORI=0TO15:READC(I)
:PALETTEI,C(I):NEXT":PRINT#J,A$:
CLOSE#J:RETURN
650 SOUND 60,3:RETURN
660 D=2:GOTO680
670 WIDTH40:D=0
680 PRINT#-D,TAB(12)"SLOT COLOR
RGB":FORI=0TO15:PRINT#-D,TAB(13)
;:PRINT#-D,USING"##";I;:PRINT#-D
,"    ";:PRINT#-D,USING"##";S(I)
;:PRINT#-D,"  ";:PRINT#-D,USING"
#";(R(I)-6)/4;:PRINT#-D,USING"#"
;(G(I)-6)/4;:PRINT#-D,USING"#";(
B(I)-6)/4:NEXT
690 RETURN
700 HCOLOR13:HLINE(36,132)-(157,
163),PSET,BF:HCOLOR14:HPRINT(5,1
7),"SLOT COLOR RGB":I=0:GOSUB870
:HPRINT(22,22),"ENTER"
710 GOSUB750
720 K$=INKEY$:IFK$=""THEN720ELSE
IFASC(K$)<>13THENGOSUB650:GOTO72
0
730 IFI=15THENRETURNELSEHCOLOR13
:GOSUB750:HCOLOR14
740 I=I+1:GOTO710
750 HPRINT(6,19),STR$(I):HPRINT(
11,19),STR$(S(I)):HPRINT(15,19),
STR$((R(I)-6)/4):HPRINT(16,19),S
TR$((G(I)-6)/4):HPRINT(17,19),ST
R$((B(I)-6)/4):RETURN
760 HCOLOR13:HPRINT(RC,10),"+":H
COLOR14:RETURN
770 HCOLOR13:HPRINT(GC,12),"+":H
COLOR14:RETURN
780 HCOLOR13:HPRINT(BC,14),"+":H
COLOR14:RETURN
790 GOTO800:A$="":HCOLOR13:HLINE
(20,173)-(215,185),PSET,BF:HCOLO
R14:HPRINT(6,22),"FILENAME:":I=0
800 A$="":GOSUB870:HPRINT(16,22)
,"FILENAME:":I=0
810 K$=INKEY$:IFK$=""THEN810
820 MOTOROFF
830 IFI<9 AND ASC(K$)>47 AND ASC
(K$)<91THENHPRINT(26+I,22),K$:I=
I+1:A$=A$+K$
840 IFI>0 AND ASC(K$)=8THENI=I-1
:HCOLOR13:HPRINT(26+I,22),RIGHT$
(A$,1):HCOLOR14:A$=LEFT$(A$,LEN(
A$)-1):GOTO810
850 IFASC(K$)=13 AND (I>0 OR J=1
 OR O=0) THENRETURN
860 IFASC(K$)=13 AND I=0 AND O=1
 THENGOSUB870:GOSUB910:GOTO590EL
SE810
870 HCOLOR14:HPRINT(4,22),"MESSA
GES":HCOLOR13:HLINE(110,173)-(28
7,185),PSET,BF:HCOLOR14:RETURN
880 HPRINT(16,22),"0-9 or A-J":R
ETURN
890 HPRINT(16,22),"ARROWS or ENT
ER":RETURN
900 HPRINT(16,22),"I-O ERROR":GO
SUB650:FORK=0TO999:NEXT:RETURN
910 HPRINT(16,22),"NEED FILENAME
":GOSUB650:FORK=0TO999:NEXT:RETU
RN
920 HPRINT(16,22),"ILLEGAL FILEN
AME":GOSUB650:FORK=0TO999:NEXT:R
ETURN
930 IFERNO=26THENGOSUB870:GOSUB9
20:GOSUB490:GOTO260
940 IFERNO=38THENEND
950 IFERNO=20THENGOSUB870:GOSUB9
00:GOTO260
960 END
970 HSCREEN0:GOSUB670:END
```


File Edit Options Colors Font Size Style
CoCo Max III
many advanced features
Animated patterns:
8 "motion" patterns:
SHRINK
STRETCH (X AND Y)
Flow brush
Rotate
zoom
and 50 more...
COLOR MIXING:
NONE ADDITIVE SUBTRACT
Color sequencing 1 to 60 step/sec
Fill
Zoom
Undo

**Software** CoCo 3

# CoCo Max III — Taking CoCo 3 Graphics to the Max

The Color Computer is an incredible machine. It is used by thousands of people every day to perform a variety of tasks. Telecommunications, business applications, games and music are just a few of the CoCo's uses. However, for many, graphics and the creation of eye-pleasing pictures remains the foremost function of the CoCo.

A lot of graphics packages have come and gone for the Color Computer, but no piece of software has caused such a revolution as *CoCo Max* did in 1985. *CoCo Max* was the first real point-and-click system for the CoCo and was truly user-friendly.

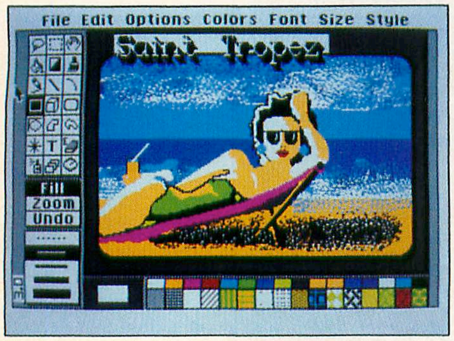
In July 1986, the CoCo 3 was introduced, and with it came an abundance of new features, such as new commands, more colors, higher resolution, more memory, faster speed and new text modes. The big question was, "Is there going to be a *CoCo Max III*?" No one really knew what would happen. In the meantime, patches and modifications were made available to convert *CoCo Max II* to the CoCo 3. However, there was no big advantage to this since the resolution and colors remained the same. There was no patch available to take advantage of the Hi-Res screen or all the new brilliant colors. Colorware mailed out letters to all *CoCo Max II* users stating there were no plans at that time to produce a *CoCo Max III*.

As time went on, many graphics packages for the CoCo 3 emerged. Among these were *CIII Graphics*, *DaVinci3*, *My Artist* and *Color Max 3*. These programs had varying levels of success, but at least a serious void was being filled for CoCo 3 graphics software.

Months later, I was reading through the September 1987 RAINBOW and I came upon a new advertisement. At first glance, it appeared to be a new *CoCo Max II* ad. A closer look revealed it was for *CoCo Max III*! I immediately called and preordered a copy; about five weeks later, it arrived. I couldn't wait to boot it up!

Before I started using *CoCo Max III*, I made a backup. *CoCo Max III* is not copy-protected, so you can make as many backups of the software as you need. However, in order to use *CoCo Max III*, you must use the Hi-Res module, which is included. Colorware has taken the standard Radio Shack module and modified it to work only with *CoCo Max III*.

The DIN plug of the Hi-Res module plugs into the right joystick port of your CoCo, and your joystick or mouse connector plugs into the DIN port on the Hi-Res module. This is a simple hookup, and it does not take up any space in your Multi-Pak or require a Y-cable.



There are two ways to run *CoCo Max III*. The method you choose depends on how much memory you have in your CoCo 3. If you have ADOS-3, you must use the `DISABLE` command to use *CoCo Max III*. If you are using a 128K Color Computer 3, you are required to make a work disk. This is done by running a file called `WDMAKER`. You must have a blank, formatted disk in order to create a work disk. On a 128K CoCo 3, the work disk is used to store the fonts, the clipboard pictures and scrapbook buffers. However, you cannot store pictures on the work disk. Colorware has used the entire disk for all the disk I/O and has left no free space on the disk. Single-drive systems require that you take out the work disk and insert a formatted blank disk. Systems with two or more drives let you use any drive 1 through 3 for picture storage and leave the work disk in Drive 0. Once the work disk has been made, you must remove it and reinstall the *CoCo Max III* program disk. Type `RUN "CM3"` and, after *CoCo Max III* loads up, install the work disk. It is that easy.

Users with 512K have it even better. Unlike a machine with 128K, a 512K CoCo 3 can load any font from memory. All clipboard and scrapbook functions are also accessed through RAM. This allows lightning fast control over all of the functions.

Even though *CoCo Max III* runs as is, it is best to customize it to your setup by running the configure program. You will be asked a series of questions on your monitor and printer type, amount of RAM, number of drives and printer baud rate. If you do not configure your *CoCo Max III* program disk, you cannot print. Once the config program is finished, you can start *CoCo Max III* by typing `RUN"CM3"`. One nice thing about the config software is that it is not erased after you run it. As your system grows and changes, just run the config program again to make the proper revisions.

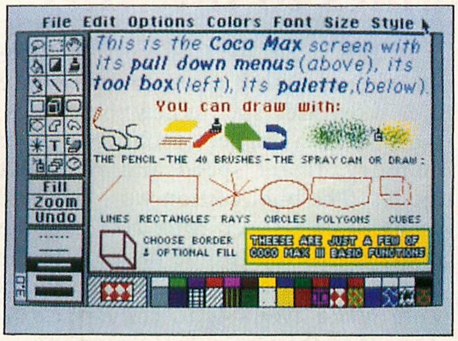
Upon running *CoCo Max III*, the title screen appears. A click of the mouse button causes the opening credits to disappear, leaving a blank window. At this point you are ready to take control of the cursor and create. Even though Colorware modified the Hi-Res module, cursor control is very smooth and clean. This is the key to quality drawing software for the CoCo.

There are various tools and patterns on the main screen, which is separated into seven segments.

First of all, there is the window. This is where you actually draw your picture. Just about every function you will use relates to the window. Pictures are saved from, and loaded into, the window.

The palette at the bottom of the window shows the 16 colors available, along with 16 of the 32 patterns. Colorware should be applauded for coming up with such a wonderful selection of patterns. The alternate set of patterns is changed by clicking on the selected pattern box.

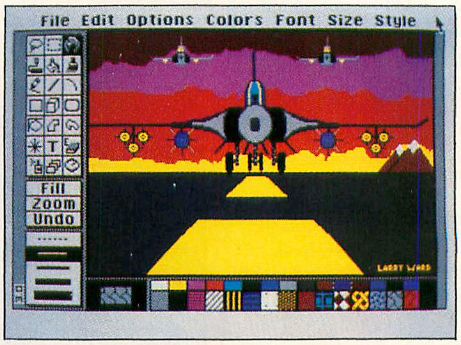
The selected pattern box is directly to the left of the palette. It is made up of an inner and outer box. The inner box is the fill/brush pattern, while the outer box is the line/border pattern. A single click on any color or pattern puts that pattern into the inner box. A double click puts it into the outer box.


This is the Coco Max screen with its pull down menus (above), its tool box (left), its palette,(below).

File Edit Options Colors Font Size Style
You can draw with:
THE PENCIL-THE 40 BRUSHES-THE SPRAY CAN OR DRAW:
LINES
RECTANGLES
RAYS
CIRCLES
POLYGONS
CUBES
CHOOSE BORDER & OPTIONAL FILL
THEESE ARE JUST A FEW OF COCO MAX III BASIC FUNCTIONS
Fill
Zoom
Undo
3.0

To the left of the selected pattern box is the line width box, which is used with the drawing tools. Selected lines are of set width but can be edited after they are drawn into the window.

Above the line width box are three toggle bars. From top to bottom they are Fill, Zoom and Undo. Selecting the Fill bar will fill a shape with the selected color. Zoom is a great feature. It allows you to enlarge a section of the window to four times its normal size, which is perfect for clean-up work.



The Undo feature is the most powerful of the three. The last action performed in the window can be voided by placing the cursor on the Undo bar. You can even undo while zooming. This feature is also reversible, so if you change your mind, you can toggle the Undo bar again to return to the original picture. The Undo feature is easy to use, too. All it takes is one push of the mouse button and you can undo anything. All in all, the three toggle bars are an important addition to *Color Max III* and help add flexibility to drawing.

Immediately up from the toggle bars is the tool box, which contains 21 icons. Many of these icons were available in *CoCo Max II*, including the lasso and move window tool; drawing tools, such as the pencil and rubber band line; and tools for creating boxes, circles, polygons, etc. *CoCo Max II* users will also recognize such features as the paint tool, paint brush, spray can, text icon and eraser. There are, however, a number of tools that are brand new, and which add to the power and flexibility of *CoCo Max III*. One new feature is the replace color tool, which is used to fill an area in the window with a chosen color or pattern. If there is an open space on the border, the color will leak, so make sure your border is solid. Leaving gaps is easy to do when zooming. Don't worry — if a mistake is made, the Undo bar is always available.

Another new tool, Arc, takes a little getting used to. Arc functions are just like the rubber band line, except they create a 90-degree arc. This is much like using a French curve tool when drawing designs on paper. You can use any color, and line width can also be changed. Also new is the cube icon. You can click and hold the mouse button to draw the front of the cube just like a square box. After drawing the front, a release of the button allows you to move around to set the angle of the other two sides. Clicking the button again locks the remaining sides in place. As usual, line width and color selection can be used. This is a super tool, although its uses may be limited to technical and architectural drawings.

Additional new drawing features include the free hand shape tool, which is a cross between the rubber band line and the polygon, and the ray tool, which can be used to draw wonderful effects.

Winding up the *CoCo Max III* icons are the flowbrush and the centered circle. The flowbrush is used under the animate mode and features the same brush shapes as the paintbrush. The great thing about flowbrush is that when used in the window, the brush shape alternates among the four animated colors. These are colors 11, 12, 13 and 14 on the palette. The slower you draw, the closer the four colors are to each other. Conversely, the faster you move across the window, the larger the color separation. The *CoCo Max III* demo gives a beautiful example of how this can be used. This is a fun tool to use and its possibilities are endless.

The centered circle is used to create circles from a center point going outward. It works basically the same as the regular circle tool. Drawing bull's-eyes and targets is simple, and all line widths and colors can be used.

The final section on the screen is the menu bar. This is located above the window and is used to pull down the seven menus. By clicking on any of the seven titles, the menus appear.

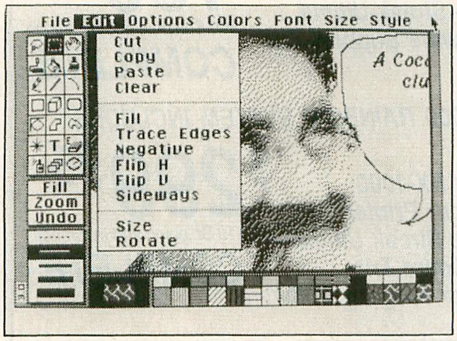
Clicking on the file menu gives you the first menu, which includes various loading and saving options, as well as features to double page size and assign drives. The file menu also allows access to the scrapbook mode and several printer options. The scrapbook mode unlinks the window from the rest of the picture, allowing you to doodle and try new drawing techniques. Toggling out of this mode returns the screen back to its original form. Objects can also be cut or copied out of the scrapbook and pasted onto another picture without harming the current drawing. Two commands are available under the scrapbook mode: Save Scrapbook and Load Scrapbook. These commands can be used to save and load entire windows onto disk for later use. They are saved with the extension `.SBK`. The scrapbook is another wondrous power of *CoCo Max III.*

Printer functions include double size, which prints out a double screen on a full-size sheet of paper or a half sheet on a half screen. This allows for excellent text print for desktop publishing.

The print option allows printer output of a drawing. *CoCo Max III* currently supports several printers. They are Epson and compatibles, Gemini, DMP-105/106, DMP-130 Serial and DMP-130/106 IBM mode. All print drivers print out pictures in black and white along with five shades of gray. Each slot prints out a specific shade, regardless of what color is assigned to it. To print in black and white, Slot 0 (white) and Slot 15 (black) must be used. Use of any other color will result in gray shades being printed. The *CoCo Max III* user's manual details shade assignments.

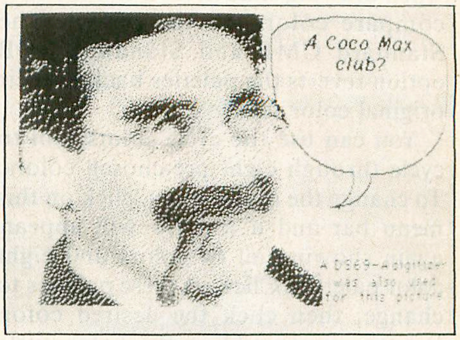
DMP-105 printouts look reasonably good. However, due to the quality of the printer itself, hard copies may be smudged or slightly blurred. Printouts from an Epson printer look perfect. The double-strike mode works with this unit and enhances the printout even more.

A CGP-220 printer driver is available for $19.95. Colorware has developed a way to print 125 colors on the CGP. There are separated color sets for RGB and composite modes. Print quality is very good and crisp for the most part, and the printout colors match the screen colors closely. This really makes *CoCo Max III* shimmer and sparkle.



Several utilities are also on the CGP-220 driver disk to allow custom palettes to be created. Other utilities allow printing of all available colors, and the *Printit* program allows color hard copies of drawings to be printed out without using *CoCo Max III.* The CGP-220 driver disk is worth every penny and more.

The second menu can be accessed by clicking the edit bar. The functions under this menu are used in conjunction with the lasso and editing box and all are grayed out except for the paste command when not using any editing tools. The functions include cut, copy, paste, clear and fill.


A Coco Max club?
A DS69-A digitizer was also used for this picture

You can also trace the outer border of an object you're editing with the trace edges feature, and turn the colors within the editing box to their opposites (for example, white turns black and black turns white).

Various other functions are available from the edit menu that allow you to flip an item you're editing (either horizontally or vertically), turn it sideways, shrink it or stretch it, or rotate it in small, precise angles.

Use of the edit menu can be very helpful to all CoCo artists. If you plan to do serious drawing, you will use this menu constantly.

Clicking on the options menu will give you a variety of artistic features that complement *CoCo Max III* very well. First is the grid tool. This is convenient for positioning text or doing technical drawings.

There are also features for pattern modification and brush selection, as well as brush mirror options, which draw proportional brush strokes either horizontally or vertically within the window.

New features include clear RAM disk, which clears pictures, scrapbooks and clipboards saved in RAM, and load font set, which loads optional fonts such as *Max Fonts.* If you create newsletters or do desktop publishing, load font set is indispensable.

The color menu really lets CoCo do what it is made for — color computing. A variety of tools allow for color changing and animation. These tools can turn an ordinary picture into a remarkable and magical picture.

The set colors tool allows you to change any of the 16 palette colors. Upon clicking set colors, a window showing all 64 available colors and the 16 palette slots appears. To change colors, simply click the palette you want to change, then click one of the 64 colors available. Presto, it is changed. To exit, *click the* OK prompt. This is a great feature — no fuss, no guess, just click to pick your color. This is a great help when drawing shades. You can actually compare colors on the screen. The Standard CMP and Standard RGB option reverts the palettes back to their original color sets.

You can use the cycle colors tool to cycle through eight pre-chosen colors. To change the cycle colors, click on this menu bar and a window will appear, again showing all 64 colors and eight color palettes. Click on these palettes to change, then click the desired color. Palette number 11 is the color cycle palette. This is one of the two powerful animation features.

The cycle speed tool allows the colors to be cycled at almost any speed from .5 steps per second to 60 steps per second.

You can control animation with the animate speed tool, which sets the rotation of the four animation colors at the same rate as cycle speed. The animate feature revolves through four of the palettes on the palette bar to create a motion type effect. This effect is similar to rotating lights on a marquee and gives the picture a magical effect almost like cartooning.

Color mixing options include: no color mix, to paint over a color by any other color; additive mix, which acts as a color mixer; and subtractive mix, which takes color away from a paint.

By clicking the font menu, there are 13 font styles available, with over 90 more that can be added. These can be loaded through the load font set option. If you own *Max Fonts*, Colorware will upgrade your original disks to work with all versions of *CoCo Max*. Send the disks along with an SASE to Colorware for the conversion. These fonts maximize the full potential of *CoCo Max III*'s desktop drawing abilities.

The size menu is used in conjunction with the fonts. Text can be stretched by using the tall or wide command. The size can be increased or decreased by using the X3/4, X2, or X4 options. All of these options can be used alone or in any combination. Unlimited sizes can be created using this menu.

Last on the menu bar is the style menu, which works with the font and size menus. Any font can use one or more of five styles. Bold, italics, outline, shadow and 3-D styles are available. To revert back to the regular style, click the Plain command at the top of the menu. Text can also be justified by using the left, centered and right functions in the style menu.

*CoCo Max III* comes with a multitude of support programs to round it out. *CoCoShow* comes on the demo disk and is used in the creation of slide shows and demonstrations with *CoCo Max III* pictures. This program is easy to use and you can use as many pictures as you can store on one disk.

The *Coltrans* software converts RGB colored files to CMP colors or CMP colors to RGB colors. This is especially useful if you upgrade from a composite monitor to an RGB display. Another use might be to transfer pictures to a friend who has a different kind of monitor.

*Translat* has the ability to read and write compressed files. This program loads picture files into memory so they can be accessed from BASIC. *CoCo Max II* pictures can also be transferred to *CoCo Max III*, then edited and colored using this fine utility. *CoCo Max II* users will find it hard not to use this program.

*CoCo Max III* is extremely user-friendly. While doing this review, my 15-year-old brother, Larry, sat down with the mouse and drew an impressive picture of an F-4 jet (see photo). He has never used *CoCo Max III* and only played with *CoCo Max II* once. You cannot get any friendlier than that.

*CoCo Max III* is also error-free. The program does not bomb out under any conditions. A Quit function on one of the menus would have been a big help, though, especially if you want to exit to

**star micronics**

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set a printer code, then jump back into the program.

*CoCo Max III* is much more than a drawing program. School projects, Christmas cards, certificates, slide shows, newsletters, labels, buttons, manuals, brochures, business cards and cartoons are just a few of the items that can be created. There are no limits to what you can do with this fabulous program.

All in all, *CoCo Max III* is a programming triumph. The *CoCo Max III* user's manual is one of the most comprehensive and easy-to-use guides I have ever seen for any CoCo program. Colorware and Dave Stampe are to be commended for their amazing creation. Speed, ease, animation, power and color, all in one package. *CoCo Max III* is the ultimate program for the CoCo 3.

**(Colorware, 242-W West Avenue, Darien, CT 06820, 800-221-0916; $79.95)**

**— Logan Ward**

**Software** CoCo 1 & 2

# *Banker II* — Expand and Manage CoCo 2 Memory

*Banker II* is a hardware and software package that is manufactured and distributed by J & R Electronics of Maryland. The product consists of a memory expansion board of either 256 or 512K RAM, an associated memory management board (called *Banker II* because it manages the memory banks in the CoCo or CoCo 2), and some associated software. The product is available in kit form or fully assembled. This review is for the fully assembled *Banker II* with 512K of RAM memory.

Unfortunately, the product arrived damaged. The *Banker* board had not survived the U.S. Postal Service, and was too badly damaged to be fixed. I contacted Jesse Jackson at J & R Electronics, and he promptly shipped me a missing installation manual and an entirely new unit for review. The unit was carefully packaged and arrived in only a few days, as promised. It was entirely functional after I reinstalled the P1 jumper cable, which had been installed backward.

The installation is solderless and can be done by anybody in less than a half hour. It requires only that you be capable of removing some IC memory chips and the SAM chip and installing in its place the *Banker II* board and a memory expansion board that fits under the keyboard. In some instances, a plastic skating pin that the keyboard rests on must be removed for the memory board to fit correctly. Otherwise, it is a relatively painless operation. I must, however, caution that if you have never opened a CoCo or other computer and have no experience or familiarity, your best bet would be to find someone to assist you (a local CoCo Club or users group might be an excellent resource).

This is a very sophisticated product that can either be very simply implemented or supercharged to a peak of performance, so this memory package is useful for both the power user and the average user. OS-9 users get the advantage of OS-9 Level II, and a superfast disk drive to really turbocharge operations. The RS-DOS users get the benefits of the memory, one or two instant access RAM disks, a sophisticated print spooler that will handle multiple copy, reset, kill, dump and speed upgrade commands by a simple `CHR$` statement, and more.

In addition, there is the `PCOPYMOR` program, the *Banker* Backup program, and the pager program, which can be used to take advantage of copying ROM to RAM memory, backing up a

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RAM disk or an upper bank of memory and, more importantly, stepping through the memory banks. This is very similar to having six 64K CoCos in one!

Also included is a bank test program that will selectively or automatically test and verify all of the memory banks. In a 512K CoCo you would now have 125 graphics pages of memory at your command! A `PCOPYDEMO` program shows you how the memory could be managed to create animated graphics screens. A program designed to work with *Telewriter-64* called `S.XXX` is also provided. Use this program with great care! It is designed to speed up and augment disk I/O by allowing the use of a RAM disk. You must load the RAM disk with the *Banker* before booting *Telewriter-64* or any text in the buffer will be overwritten and lost!

Both Jesse Jackson and Raymond Rowe have done a thorough and complete job in designing, engineering and assembling *Banker II* and its software. The user can customize the software, the source code itself and the *Banker II* memory maps any way he or she chooses, and really make it fly. The documentation on all counts is thorough and to the point. The installation manuals are thorough, too, with diagrams and careful explanations of how to handle the assembly and installation of both the assembled *Banker II* and the one that comes in kit form. Troubleshooting guides are included in both manuals and in the user manual for the software. A note of caution here, also. These are technically oriented manuals and are beyond the immediate scope of the novice.

After installing *Banker II* successfully, I had little trouble operating the associated software. I tested the equipment in several different CoCo 2s, and found that it tended to overheat about 30 to 45 minutes after power-up in some cases where the room temperature was about 68 degrees Fahrenheit. This was not always replicable, however, and could be due to a faulty power supply. I also found that occasionally, in attempting to change banks or pages, the machine would inexplicably crash. Yet I could not get the system to replicate the problems. I chalk this up to a faulty connection somewhere, and suggest to the *Banker II* user that he or she check all connections very carefully! Also, the Korean CoCo users will find the 64K chips soldered to the motherboard. Good luck removing them and installing sockets! The `CLEARFIX` patch and OS-9 `Bootfix` patch, which cure slight incompatibilities with *Banker II*, worked without problems. A note again: In switching the controllers and computers with *Banker II*, I discovered that DOS 1.0 would cause the disks to behave very erratically, while DOS 1.1 always worked fine.

In summary, I have tested this product thoroughly and rigorously under different circumstances and situations. It is a very well-designed and well-engineered product that has excellent documentation and support. The flaws and glitches I found could not be replicated in every instance and user fault cannot be ruled out entirely in these cases. What crashes I experienced could be recovered from immediately, though any data in memory was lost at system crash (warm reset was not possible due to keyboard lockout).

The documentation and support are thorough and high quality. I would recommend that 512K versions of the programs be present on the software supplied with the product so that the user does not have to customize the software if he or she has 512K installed in the computer. As the software currently exists, the user must customize the programs to take advantage of the 512K RAM. This is an excellent product for people wanting or needing more memory, but not wanting to move on to the CoCo 3.

**(J & R Electronics, P.O. Box 2572, Columbia, MD 21045, 301-987-9067 or 301-788-0861; $39.95, kit form; $169.95, fully assembled)**

**— Jeffrey S. Parker**

---

**Hardware** CoCo 1, 2 & 3

# Avatex 1200e — Economical 1200 Baud Modem

The world of personal computing continues to move onward and upward every day. In the modem industry, the 300 baud modem was made obsolete by the 1200 baud modem — which was then superseded by the 2400 baud modem. Many high-end business users are now running 9600 baud modems, and in a few years the new ISDN standard will allow communication at speeds up to 64,000 baud.

That's all well and good for those of us with deep, well-lined pockets — but CoCo users are typically economy-minded people who can't, or won't, spend such atrocious sums on equipment. That's why so many CoCo users still have 300 baud modems. But 300 baud can be a false economy when you're using a service like Delphi or CompuServe, or when you're dialing out-of-town bulletin boards and paying long distance charges. Also, some heavily used BBSs are now allowing access only at 1200 or 2400 baud, locking out the folks with older modems. What has been needed for quite some time is a 1200 baud modem for the price of a 300 — say, around $100, which is what a typical 300 baud modem often sells for. The Avatex 1200e, at $99, has finally broken the barrier.

Unlike certain other modem bargains that have popped up in the past, the 1200e isn't a stripped model, or originate-only, or a "dumb" modem, or a reconditioned used unit. It handles both answer and originate, dials with both tones and pulses, and is a Hayes-compatible "smart modem." It has the usual status lights and speaker. As best I can tell, they haven't left anything out. The secret of the 1200e's small size (6¼-by-5¼-by-1½ inches) and low cost is that it uses a new pair of integrated circuits — the SC11008 and SC11014 — to provide most of the logic and signal processing circuitry. The whole board has about as many parts as a transistorized AM radio.

The 1200e's AT command set is very close to that of a Hayes modem, though there are some minor differences that shouldn't have an adverse effect on compatibility. All 14 of the 'S' registers are available for adapting the modem to the way you prefer to use it, and all five 'X' levels are available to allow dial tone and busy signal detection. As an example, you might send this string to the modem to initialize it:

```
ATX4E0L1S11=50
```

This would set the modem for full "call progress" detection (X4), no echo of commands (E0) and low speaker volume (L1), and would change the length of dialing tones and spaces to 50 milliseconds (S11=50) for slightly faster tone dialing.

As for hardware compatibility, the 1200e can connect with modems using either the North American "Bell" 300 or 1200 baud standards, or the CCITT V.21 and V.22 standards used overseas. The 1200e is approved by the FCC and by the Canadian Department of Communications, and there should be no problem using it with a normal telephone line.

The 1200e may have problems working with some business phone systems that use A lead supervision, because it's designed for a standard RJ11 jack; also, if you have a two-line phone, or one that has a dial light powered by a separate transformer, you'll need to plug it directly into a wall jack because the 1200e's line cord and phone jack have only two wires and won't pass the second line or dial light power.

The 1200e performed well in our tests, with very few (if any) data errors, both on local and long distance lines. I honestly can't find anything really negative to say about the product, so I can recommend the Avatex 1200e highly to anyone who needs a 1200 baud modem.

**(Cinsoft, 2235 Losantville, Cincinnati, OH 45237, 513-396-7638; $99; with CoCo cable, $109; with cable and *Autoterm* software, $139)**

**— Ed Ellers**

## Software
CoCo 1, 2 & 3

# *FlightSim 1* — Up, Up and Away

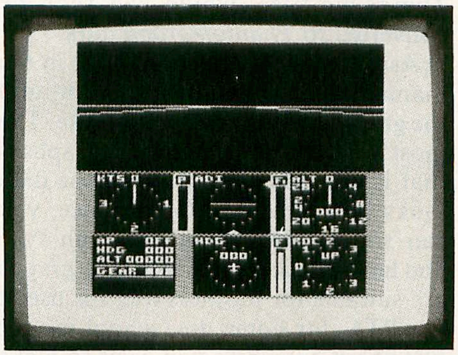
*FlightSim 1* is a flight Simulation program for the Color Computer. As a user, you fly a large commercial jet from one locale to another. To use *FlightSim 1*, you need at least 32K of memory plus two joysticks (the deluxe models are strongly recommended).

Upon loading `FLTSIM` into memory, you are presented with a screen that simulates an aircraft instrument panel (lower half of screen) and the front window view from the cockpit (upper half). The screens are in black and white, no color output being supported by the program.

Looking at the instrument panel, you will find the Airspeed and Power Indicator which gives the airspeed in knots per hour. The Power Indicator keeps you informed as to the throttle positioning. The throttle is controlled with the left joystick.

The Attitude Deviation Indicator is located in the central-top portion of the panel. This gauge shows you the aircraft's "deviation" from level flight. By watching this, you can tell if the aircraft nose is up, down, left or right.

In addition to these instruments, you are provided with a glidescope, altimeter, ROC, HDG and multifunction readout. The glidescope, located along the edges of the ADI, keeps you flying "true" on the radio beam during landing approach. An altimeter gives you altitude above sea level in thousands of feet. ROC stands for Rate of Climb; this instrument provides readouts of the rate of ascent or descent in thousands of feet per minute. The HDG, or heading gauge, acts as a compass. Other information available to the pilot includes fuel status, heading in degrees, cloud ceiling, etc.



Successfully operating the jet is fairly complicated, as might be expected with a large aircraft. You will need to spend a substantial amount of time mastering this one. Flight characteristics are realistic but unforgiving, just as the real thing.

The main weakness of this program is in the graphics display of the outside world, as seen from the cockpit window. Whether considered alone or against the other flight simulations available, these graphics are mediocre at best. It should be noted, however, that detailed graphics are not necessary for a realistic flight simulation. After all, the real counterparts take off and land in zero visibility conditions, using instruments alone.

Instructions for *FlightSim 1* are contained in a well-written manual, complete with "ground school" orientation. Putting all the realistic behavior of an aircraft into 32K of memory is quite an accomplishment and the authors of *FlightSim 1* have done this quite well.

**(Tandy Corporation, 1700 One Tandy Center, Ft. Worth, TX 76102; $24.95. Available in Radio Shack stores nationwide.)**

**— Leonard Hyre**

## Software
CoCo 3

# *Phantomgraph* — Professional Graphs on the CoCo 3

One night at a Color Computer Users Group meeting, a new CoCo user came up to me and inquired if I knew of a good graph-making program for the CoCo. He wanted one that could take his spreadsheet data and turn it into a graph for business use. My reply to him then was that I knew of no such animal. If he'd ask me today, however, I'd have just the program he needs. It is a new one called *Phantomgraph*.

*Phantomgraph* is one of the latest releases from Tandy for the Color Computer 3. It requires 512 ~~128~~K memory and either a mouse or joystick. Like all the new Tandy releases for the CoCo 3, it comes on an OS-9 Level II disk. However, because it has all of the necessary OS-9 operating system on the disk, the regular OS-9 system disk is not needed.

p538
648
RB

The manual that comes with the program is quite good. It is designed in the form of a tutorial and takes you through the features of the program step by step. You begin by making very simple graphs and then move on to more advanced ones.

As I said, the manual is quite good, but it does leave out a few things. The most important thing concerns the Save File procedure. If you follow the procedure as outlined in the manual, you'll find yourself staring at the screen wondering if your disk drives have done another one of those "silent deaths" — when the contacts on the disk-pak get corroded and need cleaning, and the drive does not come on. Well, the problem is not with the disk-pak this time, it is with the program documentation. Simply follow the steps in the manual for saving the file to disk and, after you have entered the filename, *do not* move the cursor arrow out of the dialog box, just move it off the name line and press the pointer button. (The same goes for loading in a file.)

Another problem area concerns the demo "Camp Cost" graph that you make in the tutorial portion of the manual. *Phantomgraph* runs in a graphics window. Various window types allow for only a certain number of colors. In the Type 7 window, the program allows only four colors; in the Type 8 window, it allows eight. The manual does not tell you what type of window the program initially comes up in when running the program from the "out-of-the-box" disk. Therefore, when you do the Camp Cost graph, and it draws on the screen, you'll notice part of your graph is missing. This is because the program comes up in a Type 7 window, and one of the colors you were directed to use is not supported by this window mode. To get a Type 8 window and the full eight colors, you either have to go back and modify the start-up file, create another window, or boot up with a regular OS-9 Level II system disk and initialize the W8 window screen. (Or you could simply change the color of that particular section of the demo graph to one that is recognized by the Type 7 window.)

The color limitation is really not all that limiting, because the program makes use of numerous texture patterns, as well. Therefore, a number of color/pattern combinations can be used to delineate the various items of data in your graphs.

*Phantomgraph* can make four primary types of graphs; line graphs, bar charts, pie charts and scatter charts. You can also display some of the graph types in more than one format. For example, you can display bar charts that are standard, grouped, columnar, and so on.

The program makes extensive use of "Dialog Boxes," i.e., pull-down menus. This is another example of the ease of programming power that comes with OS-9 Level II, as these are really nothing more than small overlay windows. In essence, the program uses the popular point-and-click method of operation. Just move the pointer to one of the main menu items listed across the top of the screen, click a button, and a submenu appears.

The graphs may be drawn on the screen or printed out. The screen drawing is fast — again another plus with using OS-9 Level II. Additionally, a series of graphs may be tied together into a slide-show for presentation. *Phantomgraph* contains a sequence editor to allow for the creation of a sequence file (called a Drawing file).

For hard copy printouts, the program contains a unique printer driver. Instead of merely supporting the Tandy mode of DMP printers, it also supports the IBM mode of its printers.

One of the most time-consuming aspects of using *Phantomgraph* is entering data on which to base a chart. But the programmer has even made this a little easier. The Utilities section of the main menu contains two utility files, under Convert. They are `DYNA`, which converts data from *DynaCalc* spreadsheet files into data usable by *Phantomgraph*, and `SYLK`, a procedure to convert Symbolic Link (SYLK) files to *DynaCalc* files, which can then be converted to *Phantomgraph* data.

Aside from the couple of bugs in the manual, this program is excellent, and the graphs it produces are first-rate. The most amazing thing about the graphs is that if you don't like the way the data looks in a pie chart, for instance, you can simply select another graph type and have it quickly redrawn. The graphs are suitable for business use, for use at the PTA, for home use, school use, or just about anywhere you want to make a good presentation. In short, *Phantomgraph* is an excellent program.

**(Tandy Corporation, 1700 One Tandy Center, Ft. Worth, TX 76102; $39.95. Available in Radio Shack stores nationwide.)**

#26-3276

**— Kerry Armstrong**

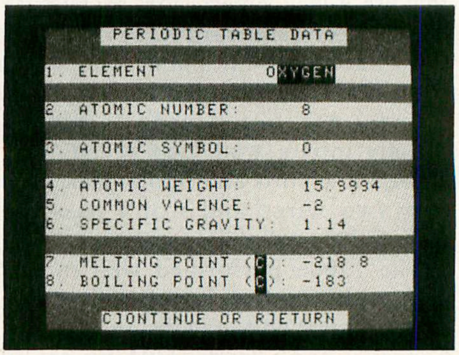
**Software** CoCo 1, 2 & 3

# Chemistry Tutor — An Excellent Learning Tool

*Chemistry Tutor* is a two-disk set for the CoCo 1, 2 or 3. The disks are not copy-protected and can be backed up for your own protection. The program can be booted with the DOS command or by typing `RUN "BOOT"`. The user is first presented with four options on a menu screen: Start Text, Start Test, Element Data and End Program.

The first option, Start Text, provides the user with six lessons covering the various technical aspects of the elements. The information provided is based on text found in various books such as *The New Encyclopedia Britannica* and *General Chemistry Principles and Structure*. The information provided consists of various definitions such as, "Matter is defined as anything that takes up space and has mass. Mass is the amount of matter that the substance possesses and has a unit of weight."

Obviously, the intent of this program is to assist a person in the study of chemistry. The information provided can be found in text books, but many people learn faster and more thoroughly when prompted by a computer. At various places throughout the lessons, a high resolution display of the element or definition is presented. The periodic table is also presented in the Hi-Res mode.



```
        PERIODIC TABLE DATA

1. ELEMENT                 OXYGEN

2. ATOMIC NUMBER:          8

3. ATOMIC SYMBOL:          O

4. ATOMIC WEIGHT:          15.9994
5. COMMON VALENCE:         -2
6. SPECIFIC GRAVITY:       1.14

7. MELTING POINT (C):      -218.8
8. BOILING POINT (C):      -183

       C]ONTINUE OR R]ETURN
```

Start Test provides the user with a multiple-choice test on each of the six available lessons. The user is prompted with the correct answer if an incorrect one is input. A continuing score is provided so that the student can keep track of his or her progress.

The third option, Element Data, provides the user with a submenu of four additional options: Study Periodic Table, Find Element Data, Quiz on Periodic Table and End This Program. If you choose to study the periodic table, you can do it either sequentially or randomly from the 106 available elements that are loaded into the computer's memory. If you choose to find element data, you can look it up by name, atomic number or atomic symbol.

The last option is a quiz on the periodic table, and the student can be quizzed by element name, atomic number or atomic symbol. The student's score is also monitored during the test and presented on the screen.

I found *Chemistry Tutor* to be an excellent learning tool. The programs are well-structured, and the many graphics pages are very well-done and of textbook quality. The programs are easy-to-use, user-friendly and self-prompting. I believe chemistry students and teachers will benefit from this software, and I recommend it without reservation.

**(A to Z Unlimited, Software Division, 901 Ferndale Blvd., High Point, NC 27260, 919-882-6255; $42 plus $3 S/H)**

**— Robert Gray**

## Software

CoCo 1, 2 & 3

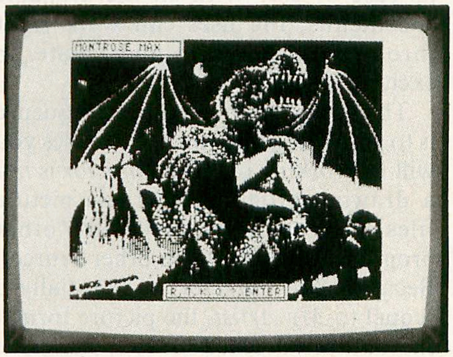
# *GrafFind* — Organize Your Picture Files

*GrafFind* is a handy graphics utility to help you organize your *CoCo Max*, *Graphicom II* and *MacPaint* picture files.

It allows you to view, rename, kill and transfer pictures from one disk to another easily and recognizes all standard 6K or 12K graphics picture files, regardless of extensions such as `.MAX`, `.BIN`, etc.

The program supplied on disk is not copy-protected, so making backup copies for your own use is not a problem. The program is written for all models of CoCo with at least 32K of RAM. It works fine on the CoCo 3, as well, but your pictures will appear in black and white if you are using the CM-8 Tandy RGB monitor.

The program works with RS-DOS 1.0 or 1.1 and the author claims that it works with ADOS, too, but I did not verify that. I did try it with RS-DOS 1.1 and ADOS 3 on my CoCo 3, and in both cases the program booted with the DOS command. The documentation is good and easy to follow. Although the program is not difficult to use, a built-in help file is available by typing ? at the user prompt.



The program is loaded in and, after a colorful title screen, the user is asked questions relating to the number of drives in use and to which drive possible file transfers will be sent. After the disk files are read into memory, they are displayed on the Hi-Res screen in two-column format with their appropriate file extension. The user can either view, transfer, kill or rename any file on the disk. You can also enter an N for a new disk without having to break out of the program and restart it. I tried each command and did not have any trouble manipulating the files contained on several of my picture disks.

The only possible problem I encountered was that the author (Steve Ricketts) used the high speed and super high speed pokes in the program. While these pokes are desirable from an operational viewpoint and improve overall program operation and flow, they do create a problem on some of the older models of the Color Computer. Fortunately, the pokes are pointed out in the documentation and can be removed from the BASIC listing using CoCo's built-in line editor. I doubt that CoCo 2s would have any problem with these pokes. The program ran fine on my CoCo 3, but I had to remove the pokes before it would run on my old CoCo 1. If you buy this program and your computer locks up, be sure to remove these offending pokes after loading, and edit the listing before running.

*GrafFind* is a good utility program and is well-written for the CoCo picture buff. If you have lots of pictures and want a way to move them around easily, I suggest you consider this program.

**(RainyDay Software, 10625 SE 362nd Ave., SP.B-32, Boring, OR 97009, 503-663-2423; $10)**

**— Jerry Semones**

## Hardware

CoCo 1, 2 & 3

# CoCo XT — Well-Designed Hard Drive Interface

Many CoCo users reach a point where they consider the use of a hard drive system. Three conditions have made this consideration less practical than it might have been. First, the cost of hard drive systems for the CoCo have not been "user-friendly." Secondly, there is a lack of general knowledge on the part of most users about how to put such a system together. Finally, most hard drive systems available in the CoCo Community have only been usable under OS-9.

The CoCo XT and CoCo XT-RTC, from Burke & Burke, address all three of these concerns quite well. It is possible to set up a 20-Meg hard drive system for around $400 using the CoCo XT interface. To set up such a system requires little technical expertise. If you purchase the optional *Hyper-I/O* software from Burke & Burke, you can use the hard drive system without going to OS-9. As shipped, the interface includes a wide variety of drivers and software for building a descriptor specific to your hard drive for use under OS-9.

The CoCo XT is designed to accept the common and popular Western Digital WD1002-WX1 and WD1002-27X (RLL) hard drive controllers used in IBM PCs and compatibles. These controllers are often shipped with bare hard drives as a package. It is easy to find low-cost 20- and 30-Meg drives in many of the "clone" magazines and catalogs. It isn't uncommon to find an ad for a bare 20-Meg drive with controller for around $260. Just make sure the controller is one of those listed above when you order the hard drive. In addition, you will need to purchase a case with power supply to house your new drive. These can be found through advertisers in THE RAINBOW.

Installation of the system is fairly straightforward and is well-covered in the user's manual accompanying the CoCo XT. You install the controller in the CoCo XT interface and connect the data and control cables between the controller and the drive. Mount the drive in the case and connect the power supply cable. Put the top on the hard drive case and enclose the interface/controller combination in its protective "sandwich." Plug the interface into Slot 3 of your Multi-Pak Interface and you are ready to begin software installation.

Simply boot OS-9 (all versions are supported) and follow the instructions in the CoCo XT user's manual. When creating the device descriptor for your particular hard drive, you will be asked for specific parameters concerning that drive. These can be found on the data sheet, which should accompany the drive when you purchase it. In addition, Burke & Burke has thoughtfully provided a table of specifications for the more common hard drives.

Since I had recently pulled a 20-Meg Seagate drive with a WD1002 controller out of my compatible and had a spare drive case with power supply on hand, I was ready to go when I received the CoCo XT interface. All told, installation was complete in about an hour. Of course, then came the somewhat tedious task of copying all of my commands and software to the hard drive. Proper use of the `Dsave` command lessened the severity of this chore, however, and I was soon under way.

The interface used for this review was the CoCo XT-RTC. This unit is identical to the CoCo XT except that it includes a hardware real-time clock. In addition to the driver and descriptor software, Burke & Burke provides several utilities for setting and reading this clock. Now when I boot my system, it tells me what time it is. I found the clock to be a handy and very welcome addition — well worth the additional $30.

From an OS-9 standpoint, the Burke & Burke interface presents a very viable option to the serious CoCo user. While installation may require some limited working knowledge of OS-9, the procedure is explained thoroughly. The interface is well-designed, and it is obvious that considerable thought went into the project during its conception. I commend Burke & Burke for providing such an alternative to the CoCo Community.

**(Burke & Burke, P.O. Box 1283, Palatine, IL 60078, 312-397-2898; $69.95; w/real-time clock, $99.95)**

**— Cray Augsburg**

**Software** CoCo 3

# *ColorVenture RAMDISK* — Instant Access for the CoCo 3

ColorVenture has released their version of the popular RAM disk for the CoCo 3. The extra memory available in the 512K CoCo 3 makes the use of a RAM disk not only practical but fun. The *ColorVenture RAMDISK* sets up two 35- or 40-track, memory-resident disk drives, providing instant access to programs or files stored in them. It's reset-protected and lets you use up to four physical drives in addition to two RAM disks. If you have ColorVenture's *Printer Lightning* spooler program, you will have the advantage of the RAM disks and printer spooler without losing any BASIC memory. All of the present disk commands are supported, and you can save your default setup so that you won't have to reconfigure it every time you boot up the computer.

A two-page, easy-to-follow instruction sheet is provided, making installation quick and easy. The program is not copy-protected, so make backup copies for your own peace of mind.

After loading, you are required to answer whether or not you want to use the default settings. New users should answer this with an N if this is the first use of the program.

If you answer no to the default question, you are provided with prompts asking what physical drives you have and by what number to designate them. In my case, since I have two drives, I set up drives 0 and 1 as my physical drives, and drives 2 and 3 as my RAM disks. If you goof, you can restart the whole process by simply pressing the BREAK key. When you are finished you will have four drives available.

To see the RAM disks in action, I put a disk chock full of games and utilities in Drive 0, typed `BACKUP 0 TO 2`, and pressed ENTER. As usual, the Drive 0 light came on, the drive churned a bit and then stopped. Typing `DIR 2` revealed that the entire contents of the disk in Drive 0 had been copied onto the RAM disk designated as Drive 2. I was then able to `LOAD` or `LOADM` any of the programs and `RUN` or `EXEC` them with instant speed.

The RAM disk is really fast in this regard, but unlike a physical disk that remembers its contents when the power is turned off, the RAM disk is volatile. That is, if you turn off the power with important data stored in it, it will be lost! So you must remember to frequently save new programs or data in the RAM disk to a real honest-to-goodness floppy.

Because *RAMDISK* is memory-resident, some programs will not work. One case in point is *Telewriter-80* — the enhanced, 80-column, CoCo 3 version of the popular *Telewriter-64* word processing program. OS-9 Level II does not work, either. There may be problems with other programs due to conflicts in memory allocation, but most of the software I tried worked fine.

One other feature I was impressed with was a provision to recover your data or program stored in a RAM disk in case of a computer crash — provided you don't turn off the computer in frustration.

I liked *ColorVenture RAMDISK*. I found it easy-to-use and a perfect companion to my CoCo 3. While no RAM disk is ever as safe as a real floppy due to its RAM dependency, it does provide an excellent method for instant access to frequently used programs and data that have been saved to a floppy.

**(Dr. Preble's Programs, 6540 Outer Loop, Louisville, KY 40228, 502-241-6474; $19.95 plus $2.50 S/H)**

**— David Gerald**

**Software** CoCo 3

# *The Director* — Create Exciting Graphics Presentations

*The Director* is the sequel to the *My Artist* program produced by SEESOF in 1987. (See RAINBOW Reviews, October 1987.) *The Director* is a graphics sequencer, but it goes beyond the ordinary. It allows the user to produce graphics displays with sound or music, color changes and time delays.

*The Director* requires a Tandy Color Computer 3 and may be run on a cassette or disk-based system. The program is written in BASIC, but it is fast. It makes use of numerous menus to allow the user to produce a short program file that will run a graphics/sound sequence. The program's manual is well-written and thorough.

What makes *The Director* special is its ease of use. With all the available sub-menus, the user can walk right through the program and create an exciting graphics presentation.

The first step in creating a sequence is to gather together the picture files you will be working on. *The Director* is *not* a drawing program, so these picture files have to be created with other programs or taken from other sources. Because *The Director* is essentially a sequel to *My Artist*, the picture format the authors decided on was the same format used by that program. However, the programmers have included a `CONVERT` utility program on the program disk that will capture almost any CoCo 3 `HSCREEN` picture and convert it to the *My Artist* format.

Bear in mind that the CoCo 3 Hi-Res mode graphics do take up a lot of disk space, so you will not be able to get too many different picture files on a disk. This is the greatest limitation to the sequencer program. Fortunately, the actual "sequence" program that *The Director* creates is not very long and takes little disk space.

I suggest the next step you take is to make some rough pencil sketches of your pictures and note the color codes for each major area of the picture. (You may recall that one of the exercises in the CoCo 3 manual was to make a list of each of the 64 color codes and name each color. It will be extremely helpful to you to find that old list, because you are going to need it.)

The reason for the sketches is quite simple. One of the major features of *The Director* is that it allows you to make changes in the various colors in your pictures. You may change individual palette slots or all of them on the fly. This makes for some degree of animation in the sequence. This feature, coupled with the Time Delay feature and the Repeat feature, can add a little life to your graphics presentations.

The Time Delay feature allows the user to set the amount of time a picture will remain on the screen before the next event happens. The event could be a color change, a picture change, or a bit of sound or music. Repeat allows the user to set up cycles of events that can be done over and over again to make a larger presentation.

Similar to Repeat is the Jump function. Jump is used to jump or skip over several events to another starting place in the sequence. Essentially, a sequence is nothing more than a list of events.

The Music/Sound features can be handled in one of two ways — either by utilizing a prerecorded cassette tape, which the sequence list will turn off and on at the designated time, or by utilizing BASIC's sound functions. Sound effects are created by the tone and duration functions of the CoCo 3 and, coupled with the `REPEAT` command, fairly decent sound effects can be created. Music may be created using BASIC's `PLAY` commands. Again, the Repeat function may be used to make longer musical pieces.

Once the user has gone through all the various steps to create a graphics sequence, he or she can run the sequence list while still in *The Director*. This allows the user to fine-tune or edit the sequence and then save the finished product to disk or cassette. Likewise, the user can always reload the sequence file into the program and add to or edit it further.

When the sequence has been saved to the disk with the picture files, the editor program is no longer needed. The authors have provided a short program on the program disk called `DISPLAY`, which they have included as shareware. This means the user can feel free to provide copies of his or her graphics presentations to others. `DISPLAY` does only one thing. It allows the user to load in a sequence file and then displays the graphics/sound sequence for viewing and listening.

You don't have to be limited to your CoCo 3 and monitor to show off your artistic talents. The CoCo 3 does have true video and audio output jacks that can be hooked to a VCR, and with the graphics and sound capabilities, some pretty neat videos could be made. Think about it. Like I said before, *The Director* is not just an ordinary graphics sequencer.

**(SEESOF, P.O. Box 574, Beaufort, SC 29901, 803-524-0116; *The Director*, $39.95; *My Artist* and *The Director*, $49.95)**

**— Kerry Armstrong**

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# Received and Certified

*The following products have recently been received by THE RAINBOW, examined by our magazine staff and issued the* Rainbow Seal of Certification, *your assurance that we have seen the product and have ascertained that it is what it purports to be.*

**Avatex 1200e**, a 1200/300 bps stand-alone modem designed for the home, school or portable computer. For the CoCo 1, 2 and 3. *Cinsoft, 2235 Losantiville Avenue, Cincinnati, OH 45237, (513) 396-7638; $99; $109 w/CoCo cable; $139 w/cable and* Autoterm.

**Big Pix 3**, a 64K graphics editor that produces a picture that is 456 pixels wide and 565 pixels high. For the CoCo 1, 2 and 3. *Tothian Software, Inc., Box 663, Rimersburg, PA 16248; $24.95.*

**EZWriter**, a 32K ECB word processor. Features allow you to save, retrieve and revise letters on tape or disk; save mailing lists; and print labels. For the CoCo 1, 2 and 3. *E.Z. Friendly Software, Hutton & Orchard Streets, Rhinecliff, NY 12574, (914) 876-3935; $19.95.*

**Graphic Echo II**, a 32K graphics screen dump available on disk or tape. For the CoCo 1, 2 and 3. *Tothian Software, Inc., Box 663, Rimersburg, PA 16248; $14.95.*

**Home Publisher**, a 128K desktop publishing program. Detailed graphics images and different sizes of text allow you to produce newsletters, memos, certificates, or any other small document using your computer and an ordinary printer. For the CoCo 3. *Tandy Corporation, 1700 One Tandy Center, Fort Worth, TX 76102; $39.95. Available in Radio Shack stores nationwide.*

**Iron Forest**, a 128K light phaser game. Your mission is to protect the sacred White Dove. Use your phaser to zap the evil creatures that inhabit the forest and threaten the dove. For the CoCo 3. *Diecom Products, Inc., 6715 Fifth Line, Milton, Ontario, Canada L9T 2X8, (416) 878-8358; $28.95 U.S.; $38.95 Cdn.; light phaser w/interface, $34.95 U.S.; $49.95 Cdn.; game and phaser together, $59.95 U.S.; $83.95 Cdn.*

**Mr. Corey**, a 64K graphics Adventure. As a member of a secret government organization, your mission is to spy on the notorious Mr. Corey. Unfortunately, you are captured and find yourself in a room with a nuclear time bomb. The fate of the world lies within your hands. For the CoCo 1, 2 and 3. *Valkyrie Software, P.O. Box 2120, Monroe, NY 10950, (914) 783-0191; $19.95 plus $2 S/H.*

Ⓕ **The Power Stones of Ard**, a 128K Adventure game. The object of the game is to find the Spirit Stone of Ard. Create your own character and begin your journey into a land of magic and monsters. For the CoCo 3. *Three C's Projects, P.O. Box 1323, Hamlet, NC 28345, (919) 582-5121; $18.*

**Sub Battle**, a World War II Simulation. For the CoCo 3. *Epyx, 600 Galveston Drive, Redwood City, CA 94063; $29.95. Available in Radio Shack stores nationwide.*

System 5, a 512K pg 154, May 88 RB

Ⓕ ~~**Systems**, a 128K~~ graphics generator that features 320-by-192 16-color graphics, pull-down and page-down point-and-click menus, full screen workspace, nine different fonts, and more. For the CoCo 3. *Elec-Soft, 803d W. 47th Street, Norfolk, VA 23508, (804) 451-1255; $12.*

Ⓕ **First product received from this company**

The *Seal of Certification* program is open to all manufacturers of products for the Tandy Color Computer, regardless of whether they advertise in THE RAINBOW.

By awarding a *Seal*, the magazine certifies the product does *exist* — that we have examined it and have a sample copy — but this *does not* constitute any guarantee of satisfaction. As soon as possible, these hardware or software items will be forwarded to THE RAINBOW reviewers for evaluation.

**— Judi Hutchinson**

# TM TOM MIX COMPANIES

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# Just What the Doctor Ordered

## By Marty Goodman
Rainbow Contributing Editor

### Memory Souped Up, Running Hot

*My 512K memory card from Disto tends to run very hot. Also, the heat sink in the CoCo 3 runs very hot. After some hours of use, the computer crashes, and memory check programs reveal errors and sometimes crash themselves. Any ideas?*

*Franz C. Shattuck*
*(GCSCOMP)*
*Hillsboro, NH*

First of all, I doubt that the make of the memory upgrade board is in any way the problem. It certainly is true that the power supply of the CoCo 3 runs its power transistor and associated heat sink quite hot in "normal" operation. A cure could involve replacing that transistor with a beefier TO3 cased unit, and whether or not you changed the transistor, you'd have to mount the regulator transistor on a more massive heat sink.

David Schoepf of Vicksburg, Missisippi, found this fix to be very effective in cutting down on the heat inside his CoCo 3, which had become intolerable when he added his 512K upgrade board. He observed that, before, the heat sink on the transistor was so hot you could not touch it without being burned. When he substituted a big, thick aluminum plate for the wimpy little heat sink Tandy supplied, the plate ran warm, but not too hot to touch. This is rather a technical hassle, and many folks consider using fans instead.

I am not a fan of fans, myself . . . I hate the noise they make, and feel the CoCo design should be able to run with convective cooling alone. But fans *do* offer the easiest solution to this sort of problem. It also seems to be the case that different brands and speeds of memory chips for the 512K board run at varying temperatures. Current wisdom would indicate that the best chips for a 512K upgrade board are NEC brand 150 or 120 NS chips. You might want to consider trying out a different set of memory chips in your board.

Finally, you might want to experiment with a different timing fix from the one recommended by Disto. Disto and most other 512K board makers recommend cutting C65 and C66 off the board to fix the timing for their 512K board. A different fix, one that some report is successful in making their DRAMs run a little cooler, is the one recommended by Hemphill Electronics for their board. They have you *leave* both C65 and C66 in place and instead have you put a 47-ohm resistor in parallel with R22 on the board. R22 is a 120-ohm (brown-red-brown-gold) resistor. You may want to try this, though you will, of course, have to reinstall the caps you removed or disconnected originally.

### Testing the Environment

*How can I detect whether my program is running on a CoCo 3 vs. a CoCo 1 or 2?*

*Jim Sparks*
*(ESCOMAN)*
*Aurora, CO*

There are any number of ways to do that. Roger Bouchard (HARBIE) of Montreal, Quebec (one of our more knowledgeable experts on the intracacies of CoCo 3 Disk BASIC), suggests checking location $E7. If it's 0, 1 or 2, you've got a CoCo 3. Those numbers will also tell you which text screen mode the CoCo 3 is in at the time.

My own suggestion would be to see if you are able to both write to and read from the first six bits of the palette registers at $FFB0 through $FFBF. That is, choose a few of those registers, read what you find in them, save that, then try writing stuff into them and seeing if you can recover that same data from those registers when you read them. Be sure to mask out (`AND 00111111`) the high order two bits of those registers when you do both the reading and writing. And, when done with this test, be sure to restore to those registers what you found in them originally.

If you find you can write data into and then read it out of the registers in that range, then you have a CoCo 3. If not, you have a CoCo 1 or 2. Note that Roger's suggestion is dependent on the way the CoCo 3's "superBASIC" ROM software works, whereas my suggestion is independent of the BASIC ROM and relies on a hardware characteristic of the GIME chip.

### Horizontal Overscan

*I'm having trouble with a CM-3 color composite video monitor when using it with a CoCo 3. In the 32-, 40- and 80-column modes, two or three characters are cut off on both the right- and left-hand sides. Can you help?*

*Dave Barnes*
*(GLENSIDE)*
*Glenside, IL*

This is not surprising. You see, when composite video color monitors and TVs leave the factory, they tend to be adjusted for folks who will be using them to show TV and VCR material. Now, TV and VCR viewers don't want to see even the slightest amount of black border around their pictures on the screen, so the sets have their horizontal width adjusted to be a bit *wider* than the actual width of the screen. In tech jargon, one would say that most commercial composite color monitors are

---

*Martin H. Goodman, M.D., a physician trained in anesthesiology, is a longtime electronics tinkerer and outspoken commentator — sort of the Howard Cosell of the CoCo world. On Delphi, Marty is the SIGop of RAINBOW's CoCo SIG and database manager of OS-9 Online. His non-computer passions include running, mountaineering and outdoor photography. Marty lives in San Pablo, California.*

# CBASIC-III

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The compiler is an optomizing two-pass integer compiler that converts programs written in Basic into 100% pure 6809 Machine Language programs which are written directly to disk in a LOADM compatible format. The programs generated by the compiler are run as complete stand alone programs. A built in linker/editor will automatically select one and only one copy of each run-time library subroutine that is required and insert them directly in the program. This eliminates the need for cumbersome, often wasteful "run-time" packages.

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CBASIC III is a Powerful tool for the Beginner or Novice programmer as well as the Advanced Basic or Machine Language programmer. You can write programs without having to worry about Stack Pointers, DP registers, memory allocation, and so on, because CBASIC III will handle it for you automatically. All you have to do is write programs using the standard Basic statements and syntax. For the Advanced Basic and Machine Language programmers, CBASIC III will let you take command and control every aspect of your program, even generating machine code directly in a program for specialized routines.

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CBASIC III is FAST. Not only will CBASIC III compiled programs execute 10 to several 100 times faster than Basic, but the time it takes to develop a CBASIC III program verses writing a machine language program is much, much shorter. A machine language program that might take several months to write and debug could be created using CBASIC III in a matter of days or hours, even for a well experienced machine language programmer. We had a report from one CBASIC user that claimed "a Basic program that used to take 3 hours to run, now runs in 7 to 8 minutes". Another user reported a program that took 1 to 1 & 1/2 hours to run in Basic, Now runs in 5 to 6 minutes!!!.

### CBASIC III is more than just a Compiler

CBASIC III has its own completely integrated Basic Program Editor, that can be used to create and/or Edit programs for the compiler. It is a full featured editor with functions designed specifically for writing and editing Basic programs. It has built in block Move and Copy functions with automatic program renumbering. Complete, easy to use inserting, deleting, extending and overtyping of existing program lines. It is also used for Loading, Saving, Appending (merging), Killing disk files and displaying a disk Directory. It also has automatic line number generation for use when creating programs or inserting sequential lines between existing lines. You can set the printer baud rate and direct normal or compiled listings to the printer for hard copy. The built in editor makes program corrections and changes as easy as "falling off a log". If CBASIC III finds an error when compiling, it points to the place in the program line where the error occured. All you have to do is tell the editor what line you want to start editing and when it is displayed, move the cursor with the arrow keys to the place where the error is and correct it. Just like that, it's simple.

### Selectable 32/40/64/80 Column Displays in 192 or 225 Res.

CBASIC III is the only Color Basic Compiler that includes it's own 32, 40, 64 or 80 by 24 line display in 192 or 225 Resolution. All of these display formats are part of the standard CBASIC III compiler package. Not only can they be used for normal program editing and compiling, but can also be included in your compiled programs, with a single command, "HIRES"!! The run-time display package is not just a simple "WIDTH 80" display, but a full featured package, far more advanced than the "WIDTH 40 or 80" displays. It will let you do things you expect like "PRINT @" as well as X,Y positioning. You can select characters per line, underline, character highlight, erase to end of line or screen, home cursor, home & clear screen, protect screen lines, and much more.

### 128K and 512K RAM Support

CBASIC III makes full use of the powerful and flexible GIMI chip in the Color Computer 3. It will fully utilize the 128K of RAM available and install 2 Ultra Fast Ramdisks if 512K is available, for program Creation Editing and Compilation. You can easily access all 512K of memory in a Compiled program thru several extended memory commands that can access it in 32K or 8K block and single or double bytes. CBASIC III also allows your program to use the upper 32K of RAM space automatically for variables or even program storage at run-time. It will automatically switch the RAMs in and out when needed. There are also two other commands that allow you to control the upper 32K of RAM manually, under program control. No other Color Basic compiler directly supports the use of Extended RAM like CBASIC III.

### All Machine Language

CBASIC III is completely written in fast efficient Machine Language, not Basic, like some other Color Basic compilers. Because of this, CBASIC III can edit and compile very large programs, even using the 80 column displays it can handle almost 40K of program. Some of the other Basic compilers can only work with 16K or about 200 lines. Even working with large programs, CBASIC III compiles programs with lightning fast speed. It will compile a 24K program to disk in less than 2 minutes! That's without a listing being generated. We've heard stories about some other compilers that take almost 10 minutes to compile a simple 2-3K program. You might inquire about this when you look at some of the other compilers available.

### Compare the Difference

CBASIC III is not just another Color Basic Compiler. It is the only complete Basic Compiler System for the Color Computer. Compare CBASIC III's features to what other compilers offer and you'll see the difference. When comparing CBASIC III to other compilers you might want to keep some of these questions in mind. Does it support I/O functions? You can't write much of a program without PRINT, INPUT and so on. What about complex string statements, or strings statements at all? Can you compile a complex string like: MID$(RIGHT$(DA$(VAL(IN$),LEN(LE$)),3,3)? How large of a programcan you write? Can you use two character variable names for string & numeric variables, like Basic? Does it support all the Hi-Res graphics statements including H/PLAY, H/DRAW, H/GET and H/PUT, using the same syntax as Basic? Do you ever have to use a separate Basic program? How long would it take to compile a 24K program? Can you take complete Basic programs an compile them without extensive changes? Will they work? How do you edit a program when it has errors compiling?

### The Finished Product

Since CBASIC III contains statements to support ALL of the I/O devices (Disk, Tape, Screen & Printer), Hi-Res Graphics, Sound, and Enhanced Screen displays, it is well suited for a wide range of programming applications. When CBASIC III compiles a program, it generates a complete, Ready to Run machine language program. The finished product or program does not have to be interfaced to a Basic program to perform some of its functions or commands. This may seem obvious to you, but some of the other Color Basic compilers don't necessarily work this way. Some of their compiler commands need a separate Basic program in order for them to work. In some cases, they require that a separate Basic program be interfaced to the compiled program to perform I/O functions, like INPUT, PRINT and so on. CBASIC III doesn't do this, ALL of it's commands are compiled into a single machine language program, that does not require any kind of Basic program to make it work.

### Price Verses Performance

The price of CBASIC III is $149.00, it is the most expensive Color Basic Compiler on the market, and well worth the investment. We spent over 3 years writing and refining CBASIC III, to make it the Best, most Compatible Color Basic compiler available. Most of our CBASIC III users already bought one or more of the other compilers on the market and have since discarded them. Before you buy a compiler, compare the performance of CBASIC III against any Color Basic compiler. Dollar for Dollar CBASIC III gives you more than any other Color Basic compiler available.

**Requires 128K & Disk $149.00**

---

*"Over the years, few products have impressed me as much as this one."* ......................The Rainbow, December 1987

To order CBASIC III by mail, send check or money order for the amount of purchase, plus $3.00 for shipping & handling to the address below.
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adjusted to have "horizontal overscan." This "overscan," as you noticed, is *not* desirable for text display.

The fix consists of readjusting the horizontal width to make it narrower and then, as need be, centering the image. On some monitors this is very straightforward, for both horizontal width and position controls are accessible from the front or back of the monitor. On other monitors, you may have to open up the set to find one or both of these controls.

The horizontal width control is typically a ferrite slug in a coil. On some sets there is so much horizontal overscan designed in that even after you maximally adjust the H width control for the narrowest width, there is still overscan. At that point you must consider replacing that coil with a different one, or altering the value of the capacitor used with that coil to generate the horizontal scan. TV repair technicians should be able to help you.

### Printer Buffer Fix

*Here's a quick fix to a printer problem I had. I have a Panasonic printer with a 1K buffer on board, driven by my CoCo's bit-banger serial port using a serial-to-parallel converter. When I added a Panasonic brand 4K addition to that buffer, the printer ceased to work. I returned the 4K buffer and ordered a 64K buffer from Polygon (made by Performance Peripherals). This, too, failed to work. Finally, I realized the problem: The placement of the buffer between the printer and my serial-to-parallel converter interrupted the power the converter needed to get from the printer. I made up a little power supply for that converter, ran it off that, and am now able to use whatever buffer I please.*

*John C. Burke*
*Fremont, CA*

### CoCo 3 Battery Backup

*Can the CoCo 3 be fitted with a battery backup such as that Harold Wolff described on Page 46 of the March 1987 issue of* RAINBOW*?*

*Michael Lewis*
*Seattle, WA*

Yes! The delightfully simple and effective circuit Harold Wolff describes will work just fine on a CoCo 3. You merely need to hook that source of 9 volts DC through the diodes to the junction of D1 and D2 on the CoCo 3 motherboard. This junction is the side of the diode that is nearest Capacitor C62. Or just use an ohmmeter to determine which side of D1 is hooked to a side of D2. You must, of course, ground the battery to the motherboard, as per Harold's instructions. To make absolutely sure you've got the right spot on the right diode, just hook a volt meter to that spot and see if the voltage there (with respect to ground on the CoCo 3 board) reads about 10 volts when the CoCo is turned on. If it does, you've got the right spot.

### OS-9 Games and Old Controllers

*Why does* Koronis Rift *not work on my CoCo 3? I'm using a J&M controller with double-sided Toshiba drives and RS-DOS Version 1.0. The game loads and runs fine on a friend's system that also has a J&M controller. When I use his controller on my system, the game also works.*

*Mark D. McDowell*
*Kokomo, IN*

The oldest model of J&M controllers often has problems running under OS-9 and other programs that run the CoCo 3 at "double speed." Note that not *all* of them have this problem, but many do. I recommend you call J&M about fixing the controller for you to make it compatible with the CoCo 3.

### Calling the Dog

*I am interested in using my CoCo 2, along with a tape recorder and a photocell-based detector, to detect when my German shepherd jumps over a fence and to activate a recording of my voice calling her back. Have you any suggestions?*

*Robert Schumacher*
*Tucson, AZ*

I don't believe that a computer is appropriate technology for that project. It seems gross overkill for the task at hand. One or two 555 timer chips would do the job just as well — better, actually, for they would be both simpler and more reliable. As for detecting the dog jumping over the fence, it is hard to do that in broad daylight with a "photocell." Some sort of ultrasonic detector might make more sense, although you might be able to use a pulsed infrared detection system, such as that used by Radio Shack's photocell detector (Cat No. 49-551 or 49-307 might be exactly what you need, although the range is limited to 30 feet). Those and similar units often have built-in provisions for turning on the alarm (the tape recorder with the continuous loop tape in your case) for several seconds, then turning it off. That would be exactly what you need. You could then merely hook the tape control switch on your tape recorder to the alarm, switch contacts on that photocell detector, and your project would be complete. I strongly feel that involving a full general-purpose microcomputer in the project would be a mistake.

It might interest you to know about a "dog trainer" friend of mine who used a pressure pad sensor to detect when the dog jumped on the bed. The pad activated a continuous tape loop for a few seconds that said (in the owner's voice), "I see you, Hannah! *Bad Girl*! Get down off that bed!" This unit used two 555 timer chips, and worked quite well.

### An Inexpensive Transistor

*A 2N3055 appears to work just fine as a replacement transistor for the pass power supply regulator transistor in a CoCo 2. This is of interest because the 2N3055 is widely available (Radio Shack carries it as Part No. 26-2020) and quite inexpensive.*

*Roger Krupski*
*(HARDWAREHACK)*
*Buffalo, NY*

Thanks *very* much for that useful tip. Your observation is even more interesting to me because the CoCo 2's service manual (American version) implies that not just any old transistor can be substituted for that pass transistor. Yet the 2N3055 is as generic an NPN power transistor as one could imagine.

**Your technical questions are welcomed. Please address them to CoCo Consultations, THE RAINBOW, P.O. Box 385, Prospect, KY 40059.**

**We reserve the right to publish only questions of general interest and to edit for brevity and clarity. Due to the large volume of mail we receive, we are unable to answer letters individually.**

**Questions can also be sent to Marty through the Delphi CoCo SIG. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type ASK (for Ask the Experts) to arrive at the EXPERTS> prompt, where you can select the "CoCo Consultations" online form which has complete instructions.**

# *** *** *** *** COLOR COMPUTER III SOFTWARE *** *** *** ***

## CBASIC III EDITOR/COMPILER

### The ULTIMATE Color Computer III BASIC COMPILER!!!

If you want to write fast efficient machine language programs and you don't want to spend the next few years trying to learn how to write them in Assembly language or with a cheap compiler, then CBASIC III is the answer!!!

CBASIC III is the only fully integrated Basic Compiler and Program Editing System available for the Color Computer 3. It will allow you to take full advantage of all the capabilities available in your CoCo-3 including 512K RAM, without having to spend years trying to learn assembly language programming. CBASIC III allows you to create, edit and convert programs from a language you are already familiar with Enhanced Disk Color Basic, into fast efficient machine language programs easily and quickly. CBASIC III supports all the enhanced hardware available in the CoCo-3, including Hi-Res Graphics, & Screen displays, Extended Memory and Interrupts (Keyboard, Timer, Serial & Clock). We even added advanced commands not available in Basic to give you a level of control only avialable to very advanced Machine Language Programmers. Plus we made it exceptionally easy to use, not like some other compilers. CBASIC III is the friendliest and easiest compiler available for the Color Computer III.

CBASIC III is a powerful tool for the Beginner as well as the Advanced Basic or Machine Language programmer. You can write programs without having to worry about the Stack, DP Register, memory allocations and so on, because CBASIC III will handle it for you automatically. For Advanced users, CBASIC III will let you control every aspect of your program, even generating machine code directly in a program easily.

CBASIC III features well over 150 Compiled Basic Commands and Functions that fully support Disk Sequential and Direct access files, Tape, Printer and Screen I/O. It supports ALL the High and Low Resolution Graphics, Sound, Play and String Operations available in Enhanced Color Basic, including Graphics H/GET, H/Put, H/Play and H/DRAW, all with 99.9% syntax compatibility. CBASIC III also supports the built in Serial I/O port with separate programmable printer & serial I/O baud rates. You can send and receive data with easy to use PRINT, INPUT, INKEY, GETCHAR and PUTCHAR commands.

CBASIC makes full use of the powerful and flexible GIMI chip in the Color Computer 3. It will fully utilize the 128K of RAM available and install 2 Ultra Fast Ramdisks if 512K is available, for program Creation, Editing and Compilation. You can easily access all 512K of memory in a Compiled program thru several extended memory commands that can access it in 32K or 8K blocks and single or double bytes.

CBASIC has its own completely integrated Basic Program Editor which allows you to load, edit or create programs for the compiler. It is a full featured editor designed specifically for writing Basic programs. It has block move and copy, program renumbering, automatic line number generation, screen editing, printer control and much more.

The documentation provided with CBASIC III is an 8 1/2 by 11 Spiral Bound book which contains approximatly 120 pages of real information. We went to great lengths to provide a manual that is not only easy to use and understand, but complete and comprehensive enough for even the most sophisticated user.

CBASIC III is the most expensive Color Basic Compiler on the market, and well worth the investment. You can buy a less expensive compiler for your CoCo-3, and then find out how difficult it is to use, or how limited its features are. Then you'll wish you had bought CBASIC III in the first place. Dollar for dollar, CBASIC III gives you more than any other compiler available. If you can find a better CoCo-3 Basic Compiler then buy it!!!

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- VT-100/52 cursor keys, position, insert/delete, PF & Alt. keys.
- Programmable Word Length, Parity, Stop Bits and baud rates.
- Complete Full and Half Duplex operation, with no garbled data.
- 9 Variable length, Programmable Macro Key buffers.
- Programmable Printer rates from 110 to 9600 baud.
- Send Files directly from the Buffer, Macro Keys or Disk.
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- Freeze Display & Review information On Line with no data loss.
- Built in Command Menu (Help) Display.
- Built in 2 Drive Ramdisk for 512K RAM support and much more.

Supports: R.S. Modem-Pak & Deluxe RS-232 Pak, even with Disk.

**Requires 128K & Disk, $59.95**

## EDT/ASM III

### 128/512K DISK EDITOR ASSEMBLER

EDT/ASM III is a Disk based co-resident Text Editor & Assembler. It is designed to take advantage of the new features available in the CoCo-3 with either 128K or 512K of memory. It has 8 display formats from 32/40/64/80 columns by 24 lines in 192 or 225 Resolution, so you use the best display mode whether you are using an RGB or Composite monitor or even a TV for your display. Plus you can select any foreground or background colors or even monochrome display modes. It will even support 512K by adding an automatic 2 drive Ultra Fast Ramdisk for lightning fast assembly of program source code larger than memory. There is also a free standing ML Debug Monitor, to help you debug your assembled programs. EDT/ASM III has the most powerful, easy to use Text Editor available in any Editor/Assembler package for the Color Computer.

- Supports Local and Global string search and/or replace.
- Full Screen line editing with immediate line update.
- Easy to use Single keystroke editing commands.
- Load & Save standard ASCII formatted file formats.
- Block Move & Copy, Insert, Delete, Overtype.
- Create and Edit files larger than memory.

The Assembler portion of EDT/ASM III features include:

- Supports the full 6809 instruction set & cross assembles 6800 code.
- Supports Conditional IF/THEN/ELSE assembly.
- Supports Disk Library file (include) up to 9 levels deep.
- Supports standard Motorola assembler directives.
- Allows multiple values for FCB & FDB directives (unlike R.S. EDT/ASM)
- Allows assembly from the Editor Buffer, Disk or both.

**Requires 128K & Disk $59.95**

## TEXTPRO IV

### "The ADVANCED COCO-3 Word Processing System"

- 9 Hi-Res Displays from 58 to 212 columns by 24 lines in 225 Res.
- On Screen Display of Bold, Italic, Underline & Double Width print.
- Up to 8 Proportional Character Sets Supported with Justification.
- Up to 80 Programmable Function Keys & Loadable Function key sets.
- Fully Buffered keyboard accepts data even duiring disk access.
- Autoexecute Startup files for easy printer & system configuration.
- 8 Pre-Defined Printer function commands & 10 Programmable ones.
- Supports Library files for unlimited printing & configurations.
- Disk file record access for Mail Merge & Boiler Plate printing.
- Completely Automatic Justification, Centering, Flush left & right.
- Change indents, margins, line length, etc. anytime in the text.
- Create and Edit files larger than memory, up to a full disk.
- Easily imbed any number of printer format and control codes.
- Built in Ultra Fast 2 drive RAMDISK for 512K support.

TEXTPRO IV is the most advanced word processing system available for the COCO-3, designed for speed, flexability and extensive document processing. It is not like most of the other word processing programs available for the Color Computer. If you are looking for a simple word processor to write letters or other short documents, and never expect to use multiple fonts or proportional spacing, then most likely you'll be better off with one of the other simpler word processors. But, if you want a powerful word processor with extensive *document formatting* features to handle large documents, term papers, manuals, complex formatting problems and letter writing, then TEXTPRO IV is what your looking for. It works in a totally different way than most word processing programs. It uses simple 2 character abbreviations of words or phrases for commands and formatting information that you imbed directly in your text. There are over 70 different formatting commands you can use without ever leaving the text your working on. There are no time comsuming, and often frustrating menu chases, you are in total control at all times. You can see what the formatted document will look like before a single word is ever printed on your printer. Including margins, headers, footers, page numbers, page breaks, column formatting, justification, and Bold, Italic, Underline, Double Width, Superscript and Subscript characters right on the screen.

TEXTPRO IV can even support LASER PRINTERS with proportional fonts, take a good look at this AD? It was done with TEXTPRO IV on an OKIDATA LASERLINE-6 laser printer!!! All the character sets used on this AD are proportional spaced characters, all centering, justification, and text printing was performed automatically by TEXTPRO IV.

**Requires 128K & Disk $89.95**

## HI-RES III Screen Commander

### The DISPLAY you wanted but didn't get on your CoCo-3

- 54 Different Character Sizes available from 14 to 212 cpl.
- Bold, Italic, Underline, Subscript, Superscript and Plain character styles.
- Double Width, Double Height and Quad width characters.
- Scroll Protect form 1 to 23 lines on the screen.
- Mixed Text & Graphics in HSCREEN 3 mode.
- PRINT @ is available in all character sizes & styles.
- Programmable Automatic Key repeat for fast editing.
- Full Control Code Keyboard supported.
- Selectable Character & Background color.
- Uses only 4K of Extended (2nd 64K) or Basic RAM.
- Written in Ultra Fast Machine Language.

HI-RES III will improve the standard display capabilities of the Color Computer 3, even the 40 and 80 column displays have several features missing. For example, you can't use PRINT @ or have different character sizes on the same screen, even when mixing text and graphics with the HPRINT command. Hi-RES III can give you the kind of display you always dreamed about having on your CoCo-3, with a wide variety of display options that you can easily use with your Basic or ML programs.

HI-RES III is totally compatible with Enhanced Color Basic and its operation is invisible to Basic. It simply replaces the normal screen display with an extremely versatile display package. With the full control code keyboard, you can control many of HI-RES III extended functions with just a couple of simple keystrokes.

**Requires 128K Tape or Disk $34.95**

## 512K RAMDISK & MEMORY TESTER

RAMDISK is an ALL Machine Language program that will give you 2 ULTRA High Speed Ram Disks in you CoCo-3. It does not need or require the OS-9 operating system. It works with R.S. DOS V1.0 or V1.1 and it is completely compatible with Enhanced Color Disk Basic! Plus it allows your CoCo-3 to run at double speed all the time even for floppy disk access!!! It will not disappear when you press reset like some other ramdisk programs. The MEMORY tester is a fast ML program to test the 512K ram. It performs several bit tests as well as an address test so you know that your 512K of memory is working perfectly.

**Requires 512K & Disk $19.95**

## "The SOURCE III"

### DISASSEMBLER & SOURCE CODE GENERATOR

The SOURCE III will allow you to easily Disassemble Color Computer machine language programs Directly from Disk and generate beautiful, Assembler compatible Source code.

- Automatic label generation and allows specifying FCB, FDB and FCC areas.
- Disassemble programs Directly from disk, unlike other disassemblers.
- Automatically locates Begin, End and Execution address.
- Output Disassembled listing with labels to the Printer, Screen or both.
- Generates Assembler source files directly to disk or printer.
- Built in Hex/Ascii dump/display to locate FCB, FCC & FDB areas.
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- Selectable Foreground & Background colors & Printer Baud rates.
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16K Disk

*If you have an idea for the "Wishing Well," submit it to Fred c/o* THE RAINBOW. *Remember, keep your ideas specific, and don't forget this is* BASIC. *All programs resulting from your wishes are for your use, but remain the property of the author.*

### *Five programs get "colorized" on the CoCo 3*

# Revising the Reservoir

**By Fred B. Scerbo**
**Rainbow Contributing Editor**

Every now and then I get a letter from someone who swears up and down that I have left a bug in one of my "Wishing Well" programs. Usually, I load the program to check it out and find that no bugs exist. Rest assured that all of my programs are tested extensively before they are published in these pages.

However, no one is perfect, and I must now admit that several recent programs do need correcting, but only for those of you who have a CoCo 3. Several months ago I finally broke down and bought a CoCo 3 system (disk drive and all). Granted, the change was long overdue. After working with the machine for a while, I started to notice what more than a few writers have pointed out to me: Some BASIC assumptions from the CoCo 1 and 2 do not automatically apply to the CoCo 3.

Therefore, this month's column is dedicated to offering short corrections or, more accurately, CoCo 3 modifications, to five recent "Wishing Well" programs, along with another nice little utility that I just threw together.

**What Went Wrong?**

With the exceptions of a few peeks and pokes, I have gone under the mistaken assumption that BASIC programs written for CoCos 1 and 2 were perfectly upwardly adaptable to the CoCo 3. This is true to a large degree — with the exception of one very important area that missed my attention.

The ever so popular red and blue artifact colors in `PMODE4` graphics are a bit more predictable on the CoCo 3 than they are on the CoCo 1 or 2. On CoCos 1 and 2, a color value of 2 or 3 might give you either red or blue, depending on your power-up. That is why so many programs have been written with the old "Press Reset Until Screen Is Red" command, which allows you to match the color set to what the program author had in mind.

For some reason, however, the CoCo 3 does not change its color set when you press the reset button. Therefore, programs that use the value 3 in a color set for red will never turn red, but will always remain blue. (Those of you using an RGB monitor have a whole different series of problems with artifact colors, but I am not even going to address those here.) This can cause problems with some machine language games, such as Tom Mix Software's *Donkey King* and *The King*, which were written years before the CoCo 3 came out. No matter how many times you press reset, you still get a blue ape!

Some of my earlier programs allowed you to select the color set from the keyboard by pressing A or B (e.g., *Rockfest I* and *II*, *Baseball Fever I* and *II*, *Football Fever*, etc.). However, in recent programs I have sometimes resorted to the reset routine because it does save time in programming. Let's take each of these programs one at a time and check the few short lines that must be added to make them work correctly in color on the CoCo 3.

Even if you do not yet have a CoCo 3, you may want to make these changes because they will still work perfectly on a CoCo 1 or 2. That way, when you upgrade to a CoCo 3, these programs will be set to work.

**Revising BLOOD**

One of my favorite sets of Simulations has to do with the human body and how it works. *Knowing Your Body: How Your Blood Works* (May 1987, Page 38) is a talking Simulation on the human blood system. The graphics and animation are nice, but not if the blood is *blue*. The four program lines shown in Listing 1 are needed to correct the color set for a CoCo 3.

These four lines can be typed in after you have loaded the original program back into memory. By retyping these lines, you will replace the old lines with the same line numbers. Also, the blood will be *red*, not *blue*.

**Revising HEART**

The same goes for the Simulation *Knowing Your Body: How Your Heart Works* (June 1987, Page 106) — the sides of the heart would be colored incorrectly. The lines shown in Listing 2 will fix that problem.

Load in the program `HEART` first, and then type the two lines over, or edit them to make the necessary changes.

**Revising *Road Skills II***

Recently I published two driver education programs. `ROADSKIL`, the first one, did not need any changes because it was done entirely in the text mode. However, the second one, *Road Skills II* (December 1987, Page 52), had graphics and used the reset routine to set the red and blue colors correctly. After loading in `ROAD II`, edit or type the six lines shown in Listing 3.

**Revising *CoCo Keys***

*CoCo Keys* (July 1987, Page 112) is a nice keyboard instructor that helps students learn the keyboard. Even though the CoCo 3 has all its arrow keys on the right, I have not redrawn the keyboard, as that would require a major rewrite of the program. I have changed only those lines that impact the color set. (See Listing 4.)

---

*Fred Scerbo is a special needs instructor for the North Adams Public Schools in North Adams, Massachusetts. He holds a master's in education and has published some of the first software available for the Color Computer through his software firm, Illustrated Memory Banks.*

**Revising *CoCo Keys 2***

*CoCo Keys 2* (August 1987, Page 92) was the second program in the keyboard series. Use the lines shown in Listing 5 to correct the color set.

The change in Line 465 will also allow you to exit the program by pressing SHIFT with the up arrow key. This feature was somehow left out of the program, so now seemed as good a time as any to correct it.

**Save Your Fingers**

The program modifications will be included on RAINBOW ON TAPE and on RAINBOW ON DISK as the following: `BLOOD.FIX`, `HEART.FIX`, `DRIVE2.FIX`, `COCOKEYS.FIX` and `SPELLKEY.FIX`.

Notice that each filename has `.FIX` as an extension. (Tape versions will not have the extension. If you are copying from tape to disk with a transfer program, you will need to rename the programs, e.g., rename `"BLOOD.BAS"` to `"BLOOD.FIX"`. Then you must resave them in ASCII format after loading them, e.g., `SAVE"BLOOD.FIX",A`.)

If you have the modifications on disk in ASCII, you will be able to simply merge them with the original programs. Use these commands:

```
LOAD"BLOOD.BAS" (the original)
MERGE"BLOOD.FIX"
```

The old lines will be replaced with the new lines without your having to type them in.

> ***"Some BASIC assumptions from the CoCo 1 and 2 do not automatically apply to the CoCo 3."***

**A Nice Little Utility**

I have been a fan of *Color Scripsit* for a long time, largely because it is so simple (though somewhat limited in power). One real pain I find when using it is having to go through the steps of making a backup copy. Therefore, I have thrown together the short program in Listing 6 that will speed up the process a little. You will still need to swap disks several times, but you won't have to use the `COPY` command with all the different filenames and extensions. You need only switch the disk.

You might ask, "Why not just use `BACKUP0`?" Well, sometimes you may have additional files on the disk you do not want copied. This speeds up the process. You can use this copier with any other disk files you want to copy — just change the data in the last line to reflect the files you want copied.

When using your own filenames, make sure to have the last piece of information be `END`, as you see in Line 100. Maybe this little program will be of help to you. I know it saves me some needless typing when making a backup of a disk.

**Conclusion**

I hope you are able to use these fixes if you have a CoCo 3. Even if you don't, you may want to make these merges so that some software is all set for you to use when you finally do upgrade. Those of you who are a bit let down by the lack of a totally new program this month, fear not — very soon I will have a new game for you! ☐

---

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**Listing 1:** BLOOD.FIX

```
275 PCLS2:A=0:B=56:CL=4:JK$=" PR
ESS RESET AND RUN IF SCREEN IS B
LUE.":GOSUB145:B=B+20:JK$=" PRES
S ENTER WHEN THE SCREEN IS RED."
:GOSUB145
310 R=2:FORI=4TO250STEP4:PSET(I,
0,R):PSET(I+2,2,R):NEXTI:GET(0,0
)-(256,2),Y,G:FORI=4TO96STEP4:PU
T(0,I)-(256,I+2),Y,PSET:NEXTI
350 BL=3:A=(RND(70)*3)+13:B=RND(
66)+10:CIRCLE(A,B),26,BL,.6:PAIN
T(A,B),BL,BL:CIRCLE(A,B),26,R,.6
:PAINT(A,B),R,R:CIRCLE(A,B),12,1
,.6,.8,.4
410 PMODE2,6:PMODE1,6:X=3:GOSUB4
15:PAINT(60+WM,18),X,X:X=1:GOSUB
415:PAINT(60+WM,18),4,1:RETURN
```

**Listing 2:** HEART.FIX

```
320 DRAW"BM52,80C1E10BU8BR56R14"
:PAINT(40,60),3,1:PAINT(150,52),
2,1:PAINT(150,90),2,1:PAINT(100,
52),2,1:PAINT(86,52),3,1:PAINT(8
6,90),3,1:PAINT(62,26),2,1:PAINT
(56,2),3,1
330 PCLS2:A=0:B=56:CL=4:JK$=" PR
ESS RESET AND RUN IF SCREEN IS B
LUE.":GOSUB150:B=B+20:JK$=" PRES
S ENTER WHEN THE SCREEN IS RED."
:GOSUB150
```

**Listing 3:** DRIVE2.FIX

```
265 PCLS2:A=0:B=56:CL=4:JK$=" PR
ESS RESET AND RUN IF SCREEN IS B
LUE.":GOSUB135:B=B+20:JK$=" PRES
S ENTER WHEN THE SCREEN IS RED."
:GOSUB135
275 PCLS0:SCREEN0,0:R=3:BL=2:FOR
I=0TO256STEP4:PSET(I,1,2):PSET(I
+2,3,2):NEXT:DIMA(20):GET(0,0)-(
256,4),A,G:PCLS0
330 PCLS4:DRAW"S16C2BM128,120R10
E10U10H10L20G10D10F10R10":PAINT(
128,20),2,2:DRAW"C4BM128,116R9E9
U10H9L18G9D10F9R9"
375 DRAW"S25BM134,126C2M+14,-18H
L26GM+14,+18"
380 DRAW"BM134,86M+7,-9HL12GM+7,
+9":PAINT(128,18),2,2
390 JK$="YIELD":B=42:A=108:CL=2:
GOSUB135:JK$=" YIELD MEANS THAT
YOU DO NOT HAVE THE RIGHT OF WAY
.":GOSUB300
```

**Listing 4:** COCOKEYS.FIX

```
10 PMODE4,1:PCLS1:SCREEN1,1:PMOD
E3:PCLS3
295 DRAW"BM2,34":FORI=1TO14:GOSU
B465:PAINT((I*18)-6,28),2,2:NEXT
300 DRAW"BM4,52":FORI=1TO11:GOSU
B465:PAINT((I*18)-2,42),2,2:NEXT
:DRAW"C4U14R32D14NL32BR4":PAINT(
(I*18)-2,42),4,4:GOSUB465:PAINT(
242,42),2,2:PAINT(242,42),4,1
305 DRAW"BM4,70U14R28D14NL28BR4"
:FORI=1TO10:GOSUB465:PAINT((I*18
)+6,60),2,2:NEXT:DRAW"U14R28D14L
28":PAINT((I*18)+6,60),2,2:PAINT
(236,60),2,2:PAINT(236,60),4,1
350 PAINT(236,6),3,1
465 DRAW"C2U14R14D14NL14BR4":RET
URN
```

**Listing 5:** SPELLKEY.FIX

```
10 PMODE4,1:PCLS1:SCREEN1,1:PMOD
E3:PCLS3
280 DRAW"BM10,16":FORI=1TO13:GOS
UB495:PAINT(4+(I*18),12),2,2:NEX
T
285 DRAW"BM2,34":FORI=1TO14:GOSU
B495:PAINT((I*18)-6,28),2,2:NEXT
290 DRAW"BM4,52":FORI=1TO11:GOSU
B495:PAINT((I*18)-2,42),2,2:NEXT
:DRAW"C4U14R32D14NL32BR4":PAINT(
(I*18)-2,42),4,4:GOSUB495:PAINT(
242,42),2,2:PAINT(242,42),4,1
295 DRAW"BM4,70U14R28D14NL28BR4"
:FORI=1TO10:GOSUB495:PAINT((I*18
)+6,60),2,2:NEXT:DRAW"U14R28D14L
28":PAINT((I*18)+6,60),2,2:PAINT
(236,60),2,2:PAINT(236,60),4,1
340 PAINT(236,6),3,1
465 IFX$=G$(Z)THEN475ELSEIFX$=""
THEN445
495 DRAW"C2U14R14D14NL14BR4":RET
URN
```

**Listing 6:** COPIER

```
10 REM EASY COPY-BY F.B.SCERBO
   (C) 1988
20 READ A$:IFA$="END"THEN60
30 GOSUB70
40 COPY A$
50 GOTO20
60 CLS:PRINT"COPY COMPLETED":END
:NEW
70 CLS:PRINT"INSERT SOURCE DISKE
TTE AND PRESS'ENTER'"
80 X$=INKEY$:IFX$<>CHR$(13)THEN8
0
90 RETURN
100 DATA "DOS/BAS","DOS/BIN","SC
RIP/BIN","COPIER/BAS",END
```

# DOCTOR Q&A ASCII

By Richard E. Esposito
Rainbow Contributing Editor
with Richard W. Libra

### Tandy — the Joystick Pick

*The only joysticks that I can find on the market for the CoCo are the ones from Radio Shack. Are there any other brands that will work with the CoCo? And where can I get colored ribbons for my DMP-105?*

*Ron Mills,*
*Bonnyville, Alberta*

℞ Atari joystick interfaces are available for the CoCo, but Atari-type joysticks have switches instead of the potentiometers that are in the CoCo's sticks. With the Atari-type sticks, the computer can sense only certain directions, making them incompatible with much CoCo software. The Tandy deluxe joystick is a bargain. It is made by Kraft, one of the leaders in the field.

The Great Lakes Ribbon Company, in Kettering, Ohio, (800) 621-9127, claims over 300 styles of ribbons in black, red, blue and green.

### Relational Reference

*Where can I get information on how to write a relational database system for the CoCo?*

*Bob Williams*
*Baltimore, MD*

℞ *RISS: A Relational Database Management System for Minicomputers* by Meldman, et al, Van Nostrand Reinhold, 1978, contains BASIC source code for a relational database system.

### Random Executions

*Sometimes when I load in a machine language program, I type* `EXECC` *instead of* `EXEC`. *When I do this, the machine's memory messes up and I get garbage on the screen. Would you please explain what is happening?*

*Chris Romance*
*Massapequa Park, NY*

℞ When you type `EXECC`, you are telling the computer to execute a machine language program that has an `EXEC` address at the address in memory that is stored in the BASIC variable `C`. If you have not stored a value in `C`, it defaults to zero. So, in effect, you have typed `EXEC 0`, and the computer starts executing at Address 0. Since there is no rational machine language program at Address 0, the computer executes those "random" instructions, giving you garbage on the screen. When this occurs, the safest thing to do is to power down and start over.

### Multi-Pak Upgrade

*I purchased a CoCo 3 and a 512K RAM upgrade along with a Tandy CM-8 monitor. Now with many of my machine language games I get beautiful black-and-white pictures. Is there special hardware or software I can use to correct this situation? I have heard that the CoCo 3 is incompatible with the Multi-Pak #26-3124. When I power up the CoCo 3 and the Multi-Pak at the same time via a power strip, everything seems to work OK, but if I first power the Multi-Pak and then the computer, I get a screen full of garbage.*

*Jean Gravelle*
*Gatineau, Quebec*

℞ Your Multi-Pak can be upgraded with a satellite board, which requires soldering. The board is available from Radio Shack National Parts (#AXX-7119). The instructions on how to perform this upgrade appeared in Marty Goodman's "A PAL for Your CoCo 3" (January 1987, Page 98). This upgrade can also be done by Radio Shack for an additional service charge. The older Multi-Paks (#3024) are upgraded more easily by replacing the PAL chip (plug-in replacement #AXX-7123 — no soldering necessary).

### Computer Doe

*I just acquired an Infoton Mod. Vistar GT 050001 computer. I repaired it, and now it does work, but I'd like to know if it's compatible with anything. I tried contacting the manufacturer, but my letter was returned as non-deliverable.*

*Dan Griffin*
*Avondale, AZ*

℞ If it has a Z-80 or 8080 microprocessor, it might be CPM. If it has an Intel 8088 or 8086, it might be DOS. Otherwise, it's one of the many orphaned computers that did not have the staying power of the Color Computer. Our beloved CoCo even predates the IBM PC and is still a viable machine because the 8/16 bit 6809E processor it uses was right on the leading edge of technology at the time of its introduction. Tandy has rightly continued the line, upgrading it over the years while maintaining all-important backward compatibility with previous CoCos. The CoCo survived industry shakeouts that killed off many of its rivals such as Texas Instrument's 99/4A, the Osborne-1, Atari 800, Commodore VIC 20, etc.

---

*Richard Esposito is a senior project engineer with Northrop Corp. He holds bachelor's, master's and doctorate degrees from Polytechnic Institute of Brooklyn. He has been writing about microcomputers since 1980.*

*Richard Libra is a simulator test operator for Singer Link Simulation Systems Division.*

### Beefing up BASIC

*Can you use other languages besides ML to program the extra keys on the CoCo 3 to execute commands such as* `PRINT#-2,`*? Tandy's Model 100 has a method for programming its 'F' keys, and it would be nice to be able to do this with the CoCo 3.*

*Steven Bosze*
*Brooklyn, NY*

℞ *ADOS-3*, sold by SpectroSystems, adds a number of enhancements to Disk BASIC, including special keys for `PRINT#-2,`.

### ML CoCo-PC Transfer

*Is there any way to transfer machine language programs from a CoCo to an IBM PC compatible?*

*Elliot Markus*
*Wyncote, PA*

℞ The code can be transferred with *CoCo Util II*, sold by Spectrum Projects. But since the IBM PC and compatibles can run only machine language programs written for the Intel 8086, the CoCo's Motorola 6809E code will be available only for examination on those machines (it will not run on an 8086).

### The Dirt on Downloading

*How can I download programs and run them? I'm using a CoCo 1 and* Colorcom/E *Version 2.3.*

*Bill Pennington*
*Middlesex, NJ*

℞ Generally speaking, most terminal programs have a buffer capture function to let you capture data received from the system you're connected to. On Delphi or other BBSs, you can use this feature to download ASCII text or program files. The procedure on Delphi (similar for other BBSs or services) for a simple ASCII buffer capture is as follows:

1) Clear your terminal's buffer.

2) At the `ACTION>` prompt, enter `DOWN`.

3) After Delphi tells you to "Press Return When Ready," open your buffer and press ENTER. You will see the file on your screen.

4) When the download is complete, you'll see a message like "Download of 132 Lines Complete." With some terminal programs you will hear a beep, as well. Close your buffer and save the contents to tape or disk. If there is more than one file to be received, clear your buffer and press ENTER to start receiving the next file. Note: If the file is a BASIC program, you will get a ?DS Error message when you load the program back into the CoCo; however, this has no ill effect on the program. After loading, re-save the program to eliminate this error.

The procedure for an Xmodem download (not available with all terminal programs, but needed to download non-ASCII files or machine language files) is as follows:

1) At the `ACTION>` prompt, enter `XDOWN`. Delphi will respond after a few seconds with `OK, RECEIVE!`.

2) Switch your terminal program into Xmodem receive mode. The file will be transmitted after a pause.

3) After the transfer is complete, save your buffer contents to tape or disk. You may need to specify how the file is to be saved (machine language or ASCII).

### CoCo 3 Shows Off

*I would like to really show off my CoCo 3. Is there a way to run programs such as* Koronis Rift, Deskmate *and* Rogue *in windows? Is there a way to use my Hi-Res Joystick Interface with* Deskmate 3*? How do I fix programs to run with a hard disk?*

*Tony Mantegna*
*Brooklyn, NY*

℞ It is possible to create an OS-9 boot that supports both graphics windows and VDG screens. First, use `config` to create a customized version of OS-9, selecting your favorite parameters and `term_win`. Then using `OS-9Gen`, create an improved boot using in your bootlist the newly created `OS-9Boot` with `Vdgint.IO` from the `Modules` directory. After building a system with this boot, you can create VDG windows using the normal window descriptors by typing `xmode /wn type=1; shell i=/wn&` where `n` = window number. You can then press CLEAR to select a window to run one of your VDG programs.

Note that many VDG programs require patching because they are hard-coded to run with `.TERM`. Kevin Darling, assistant SysOp on CIS, volunteered the following patch for *Deskmate 3*, which makes its windows compatible and also fixes it so that it uses the Hi-Res Joystick Interface:

```
LOAD /D0/CMDS/DESK
MODPATCH -S
L DESK
C 00F0 03 02
C 00F1 10 12
C 00F2 3F 12
C 00F3 84 12
C 00F4 10 12
C 00F5 25 12
C 00F6 19 12
C 00F7 CF 12
C 00FF 00 01
C 0CAB 26 12
C 0CAC 08 12
C 0CBE 26 12
C 0CBF 08 12
C 1DC7 7D F6
C 1DC8 82 3A
C 1DC9 86 45
V
```

To make this change permanent, use the Level I `Save` utility or the `Save` utility that comes with *Multi-Vue*.

*Koronis Rift* can be made VDG window-compatible with this patch:

```
LOAD /D0/CMDS/KORONIS
MODPATCH -S
LOAD KORONIS
C 2B 03 02
C 2C 10 12
C 2D 3F 12
C 2E 84 12
V
```

*Rogue* will run in a normal window after running `Makegw` to set up the graphics. Note that after saving patched routines, you need to use `attr` to reset the permissions.

Instead of patching programs piecemeal for a hard disk, I set up my Burke & Burke hard disk with three descriptors — `/D0`, `/H0` and `/D0` — all referring to my hard drive so that old floppy software (using `/D0`), old hard disk software (using `/H0`) and new software (using `/DD`) all work without drive access modifications. I set up new descriptors `/F0`, `/F1`, etc., for my floppies.

**For a quicker response, your questions may also be submitted through RAINBOW's CoCo SIG on Delphi. From the CoCo SIG> prompt, pick Rainbow Magazine Services, then, at the RAINBOW> prompt, type `ASK` for "Ask the Experts" to arrive at the EXPERTS> prompt, where you can select the "Doctor ASCII" online form which has complete instructions.**

# OWL-WARE

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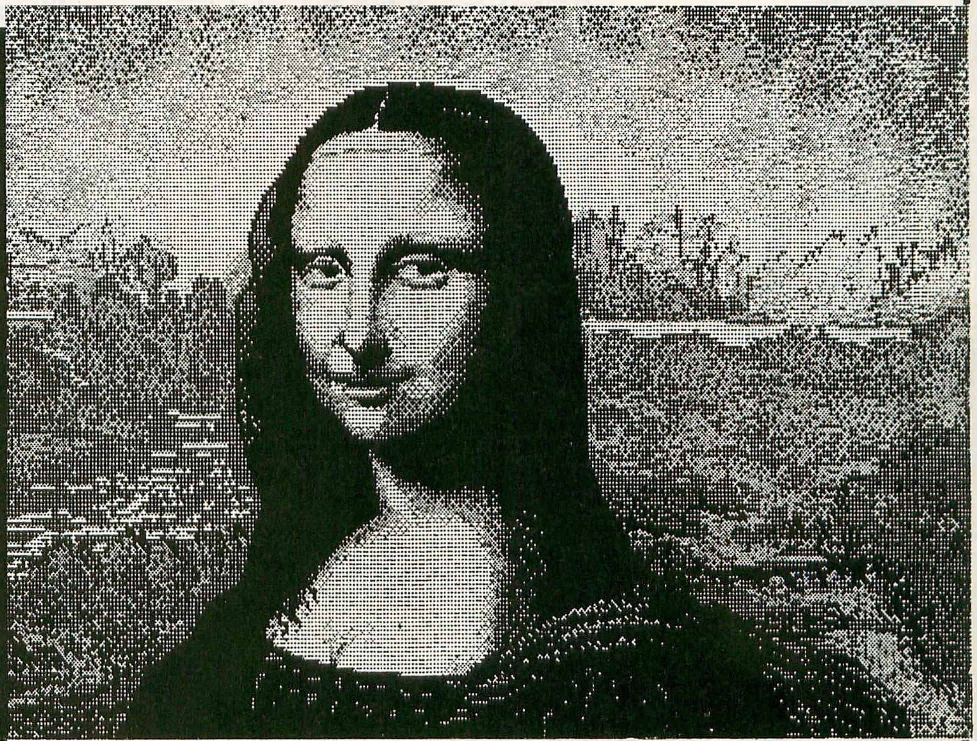

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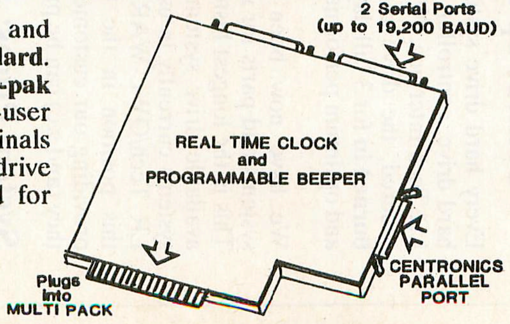

More Ads... ⇨

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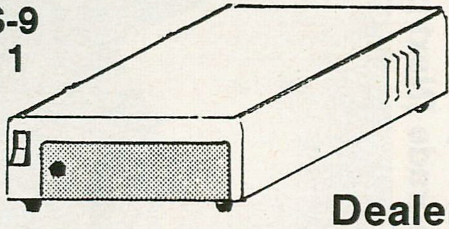

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For those who want to put together their own system, we have an exclusive arrangement to distribute the LR Tech Interface. Please note that an interface is not a controller. **A Xebec, WD, or Adaptec SASI controller are required for a drive system.**

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### In Answer for the Many Reqests to Run BASIC from a Hard Drive

With the development of the CoCo 3, OWL Ware has been able to provide a truly professional Hard Drive System using OS-9. There has not, however, been a method of running your programs from the standard BASIC. With this latest development of the CoCo software aces, it is now possible to partition your hard drive into RSDOS and OS-9 sections. The OS-9 partition runs your OS-9 normally. The RSDOS section is further divided into a number of floppy sized units to run RSDOS programs. The familiar RS disk commands work normally. There is little more that must be learned.

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*A DOS expansion project for experienced hackers*

# Build a Half-Megabyte ROM Disk

**By Tony DiStefano**
**Rainbow Contributing Editor**

Last month we talked about high-capacity EPROMs from 8K (the 2764) all the way to 64K (the newest member of the family, the 27512). We also talked about hooking up these chips to your CoCo.

The 2764 and the 27128 (16K) can be hooked up directly to the CoCo. The 2764 is easy to hook up, as it has only 8K of memory. In any ROM chip, only the first 8K of memory is valid — the rest of it is memory mirrored.

As we get into more memory per chip, we are faced with more options. For example, do we use the 27128 as one complete 16K package, or do we split it up into two packages of 8K and select between the two? Do we make it selectable in software or in hardware, or both? Look at the Radio Shack Multi-Pak, which does all of this.

All these possibilities can be overwhelming to a novice hardware hacker. For that matter, the ramifications of EPROMs aren't all that clear to the pros, either. What I am attempting to do is take a close look at large capacity EPROMs and describe how to hook them up to the CoCo and have a big enough EPROM package to make a ROM disk.

The CTS pin can access up to 16K on CoCos 1 and 2, and can access up to 32K on the CoCo 3. But because only the CoCo 3 can access 32K, I am limiting my possibilities to 16K — otherwise, we'd have to throw in another variable, which would only add to the confusion. Besides, the 32K mode of the CoCo 3 is rarely used, if at all.

Let's start with something we are already a little familiar with, DOS. Now, the DOS ROM that Tandy offers is called Disk Extended BASIC. While we are on the subject of DOS, let me clear up a little misconception. There are only two versions of this DOS — the older 1.0 and the newer 1.1. When you power up a CoCo 3 with a Tandy DOS in the controller, you see one of two messages: If you have Tandy DOS 1.0, you get the message "2.0"; if you have Tandy DOS 1.1, you get "2.1." You see, the '2' part of the version belongs to the version of Hi-Res BASIC you have, not to DOS — the ".0" or ".1" part of the version belongs to DOS. I just thought I would clear this up because I hear too many times that someone has DOS Version 2.1.

Well, back to work. Whatever the version, Tandy DOS is contained in an 8K ROM. ROMs are masked at the factory and cannot be changed, but EPROMs are user-programmable. You can change them any time you want, as they are erasable. I think I have said enough about the structure of EPROMs. Read last month's article for more details.

There are a lot of people who are familiar with DOS and would like to expand it — add in their favorite utility, for example. To expand DOS, you need more memory space, so the only thing to do is change to a 16K EPROM. That gives you about 8K of extra space to work with. To have more than that requires more space.

This is where you have to start with bank switching. Bank switching means that you have more than one memory chip mapped in the same area, but only one of them is active at a time. Last month we looked at a technique that required a hardware switch to physically change the access to the EPROMs. That is a simple technique, but there are some limitations, the biggest one being that the software will most likely get lost and cause the computer to crash when you switch it. It is OK when you want to completely change and power down anyway, but not too practical when you have a lot of software already loaded and need just a little utility.

Preventing a crash that may occur when you turn the switch is not too difficult if you know how. Have the CPU turn the switch for you — this is called a "softswitch," and requires a latch, some decoding and a circuit. With this latch we can switch between quite a few things. What I want to show you is a way to access eight EPROMs of varying sizes. Figure 1 shows the circuit required to wire up eight 27512 EPROMs. That gives you a total of half a megabyte of EPROMs, or, in other words, one big ROM disk.

Before you run out and buy all the parts and try building the ROM disk, keep in mind that this is one heck of a big project. A project that should not be tried by everyone. First of all, you must have a lot of patience — to solder eight 28-pin EPROM sockets takes many hours. Second, you must have lots of money to buy eight 27512 EPROMs. In addition to a disk drive, you must also have a Multi-Pak. And lastly, you must have a lot of knowledge about machine language drivers for disk drives. So, you see, this is a big one. If you have all the prerequisites, let's start.

The first thing to do is get acquainted with the circuit. U1 simply gates the SCS with the Read/Write line. All this does is prevent you from switching the data in the latch just by reading that memory area. So, this becomes a "Write Only" byte. Since it uses the SCS pin, this byte is mapped at $FF40. In fact, it is mirrored from $FF40 to $FF47. U2 is a six-bit latch. The diagram says that the inputs are from D1 to D6, but they are in fact connected from D0 to D5, respectively. The latch is connected to the output of U1 and is cleared to all 0s when the reset button is pressed.

The output of U2 is six bits that are controlled by writing to it. Let's look at the last three bits first, Q4, 5 and 6. They go to the inputs of a 3-to-8 decoder. These three pins select one of eight outputs. The other inputs to U3 are the CTS pin and the E clock. The E clock is needed to make sure the data is in sync with the CPU.

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*Tony DiStefano is a well-known early specialist in computer hardware projects. He lives in Laval Ouest, Quebec.*

# Sugar Software

## ☞ Get Smart, Have Fun and Save $50! ☜

Order the new *Educational Combo* package by April 31, 1988 at the introductory price of $48.50. The Combo includes these educational (and entertaining) games: **Silly Syntax** (with 2 stories), **Galactic Hangman** (700 word vocabulary), **The Presidents of the USA** (includes well over 35 presidents), **The Great USA** (even little-known states are covered) and **Trig Attack** (Zap those *Trigs*). For children ages 5-10 through adult. Disk only; **$48.50**; S&H $1.50.

## CALLIGRAPHER

**CoCo Calligrapher** - (Hybrid BASIC/ML) Turn your CoCo and dot-matrix printer into a calligrapher's quill. Make beautiful invitations, flyers, certificates, labels and more. Includes 3 fonts: *Gay Nineties, Old English* and *Cartoon.* The letters are ½ inch high and variably spaced. Works with many printers including Epson, Gemini, Radio Shack, Okidata 92A, Banana and Prowriter. Additional fonts are available (see below). Tape/Disk; **$24.95.**

**OS9 Calligrapher** - (C) Although a different program from the CoCo Calligrapher, the OS9 Calligrapher prints all the same fonts. It reads a standard text file which contains text and formatting directives. You may specify the font to use, change fonts at any time, centering, left, right or full justification, line fill, margin, line width, page size, page break and indentation. Similar to *troff* on UNIX™ systems. Includes Gay Nineties, Old English and Cartoon fonts. Additional fonts are available (see below). Disk only; OS9 Level I or II; **$24.95.**

**Calligrapher Fonts** - Requires Calligrapher above. Each set on tape or disk; specify RSDOS or OS9 version; **$14.95** each. **Set #1** - (9 fonts) Reduced, reversed and reduced-reversed versions of Gay Nineties, Old English and Cartoon; **Set #2** - (8 fonts) Old Style and Broadway; **Set #3** - (8 fonts) Antique and Business; **Set #4** - (8 fonts) Wild West and Checkers; **Set #5** - (10 fonts) Stars, Hebrew and Victorian; **Set #6** - (8 fonts) Block and Computer;

**Economy Font Packages** on disk; specify RSDOS or OS9; **29.95: Font Package #1** - Above font sets 1, 2 and 3 (25 fonts) on one disk. **Font Package #2** - Above font sets 4, 5 and 6 (26 fonts) on one disk. Both Packages #1 and #2 (51 fonts) on one disk; **49.95.**

**Calligrapher Combo** Package - *Everything!*; specify RSDOS or OS9; Includes the Calligrapher and both Font Packages on two disks; **$69.95.**

## UTILITIES

**Piratector** - (100%ML) Utility to allow your own *disk-based* BASIC or ML programs to display a graphics title screen and then self-start after loading. Adds copy protection to your programs but still allows users to create *non-executable* backups! Includes Semigraf. Disk only; CoCo 1, 2, 3 (except Semigraf); **$39.95.**

**Super Screen Machine** - (100% ML) Put your CoCo into high resolution mode for your own BASIC or ML programs. Smooth scroll, key click, lower case with colored characters. Tape/Disk; 32K CB; CoCo 1, 2, 3 (except 64K mode); **$19.95.**

**Color Disk Manager** - (100%ML) Disk utility with these features: Disk repair, selective track initialization, verify sectors, backups, tape to disk transfer, ROM Pak execution from disk, much more! Tape/Disk; CoCo 1, 2, 3 (except for 64K mode); **$24.95.**

**Color Tape Manager** - (100% ML) Tape utility with these features: display start, end and exec address of ML programs, convert ML programs into *DATA* statements, append ML to BASIC, much more! Tape/Disk; 16K ECB; CoCo 1, 2, 3 (except for 64K mode); **$19.95.**

**OS9 Patcher** - (C) Display and modify the contents of a file or memory module. Hexidecimal, decimal and ASCII modes. Search feature. Calculates module CRCs; Generates patch command files. Disk only; OS9 Level I or II; **$19.95.**

## INFORMATION MGT.

**TIMS (The Information Management System)** - (Hybrid BASIC/ML) Tape or disk, fast and simple general data base program. Create *files* of *records* that can be quickly sorted, searched, deleted and updated. Powerful printer formatting. Up to 8 *user* fields, sort on up to 3 fields. Tape/Disk; **$19.95** (see combo pkg below).

**TIMS Mail** - (Hybrid BASIC/ML) Tape or Disk based mailing list management program. Files are compatible with TIMS. Fast and simple to use. Supports labels 1, 2 or 3 across, 2½ to 4 inches wide. Tape/Disk; **$19.95** (see combo pkg below).

**TIMS Utility** - (Hybrid BASIC/ML) Utility companion for TIMS and TIMS Mail to allow multi-term search (*AND* and *OR* logic), global change and delete, split large files and more! Tape/Disk; **$14.95** (see combo pkg below).

**TIMS Combo Package** - All three of the above programs: TIMS, TIMS Mail and TIMS Utility on one disk - **$34.95.**

## SPORTS STATISTICS

Statistics programs for the coach, team manager or avid fan who wants to keep accurate team and opponent records. Printer output supported. The following are available: Baseball, Basketball, Football and Soccer. Disk only; **$19.95** each.

## EDUCATIONAL

**Trig Attack** - (100%ML) Ages 9 and up. In this educational arcade game, enemy *trigs* travel along math curves. Players learn important mathematical concepts as they play. Sound effects, colorful graphics. Excellent manual includes an introduction to trigonometry. Tape 16K CB/Disk 32K ECB; CoCo 1, 2, 3; **$19.95.**

**Silly Syntax** - (Hybrid BASIC/ML) Ages 5 and up. Story creation game; output to screen or printer; includes 2 stories or create your own. Tape/Disk; **$19.95** or disk with 62 stories for **$29.95**. Sets of 10 stories on tape/disk for **$4.95**: Fairy Tales, Current Events, X-Rated, Sing-Along, Adventure, Potpourri.

**Bible Stories Adventure** - (Hybrid BASIC/ML) Ages 4 & up. A graphics adventure game for young children & their families. Old testament. Tape/Disk; **$19.95.**

**The Presidents of the USA** - (100% ML) Ages 10 and up. Two trivia games, user modifiable, printer output supported. Tape/Disk; 16K ECB; **$19.95.**

**The Great USA** - Ages 9 and up. Trivia game of the 50 states. Capitals, nicknames, abbreviations, flowers, trees and birds. Tape/Disk; 16K ECB; **$19.95.**

**Galactic Hangman** - Ages 7 and up. Exciting new twist to the popular word game. Outstanding graphics; 700 word vocabulary. Tape/Disk; 16K ECB; **$19.95.**

**PreReader** - (Hybrid BASIC/ML) Ages 3-5 (level I); Ages 5-7 (level 2); Great graphics and music. Level 1: match colors, shapes, letters and numbers; Level 2: match letters and consonant blends with their sounds. Tape/Disk; Joystick; **$19.95.**

**Statgraf** - High school and college level; Linear regression analysis program combined with a plotting and line graphing system. Up to 250 x/y pairs; data transformation; residuals; regression line; print graph with screen print program (not supplied); Tape/Disk; **$19.95.**

## SPECIAL INTEREST

**Rental Property Income and Expense Management Package** - Maintain your rental property income and expense records. Print output supported. 28 expense categories. *This program may be tax deductible.* Disk only; **$29.95.**

**Radio Systems Design Calculations** - Performs 14 different calculations commonly used in design or evaluation of land mobile radio systems, satellite TV, etc. Tape/Disk; **$19.95.**

**CoCo Knitter** - Easy to use program to display or print instructions to knit a sweater: Cardigan or Pullover; Round or V-neck; Raglan or Set-in Sleeve; 3 weights or yarn; 8 sizes from baby to man. Tape/Disk; **$19.95.**

**Flying Tigers** - (100% ML) Fast *Defenders* style arcade game. 5 levels of difficulty; Outstanding graphics and sound effects. Tape/Disk; Joystick; **$19.95.**

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P.O. Box 7446
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*All programs run on the CoCo 1, 2 and 3, 32K Extended Basic, unless otherwise noted.* Add $1.50 per tape or disk for shipping and handling. Florida residents add 6% sales tax. COD orders add $5. Dealer inquiries invited. Orders generally shipped in 24-48 hours. No refunds or exchanges without prior authorization.

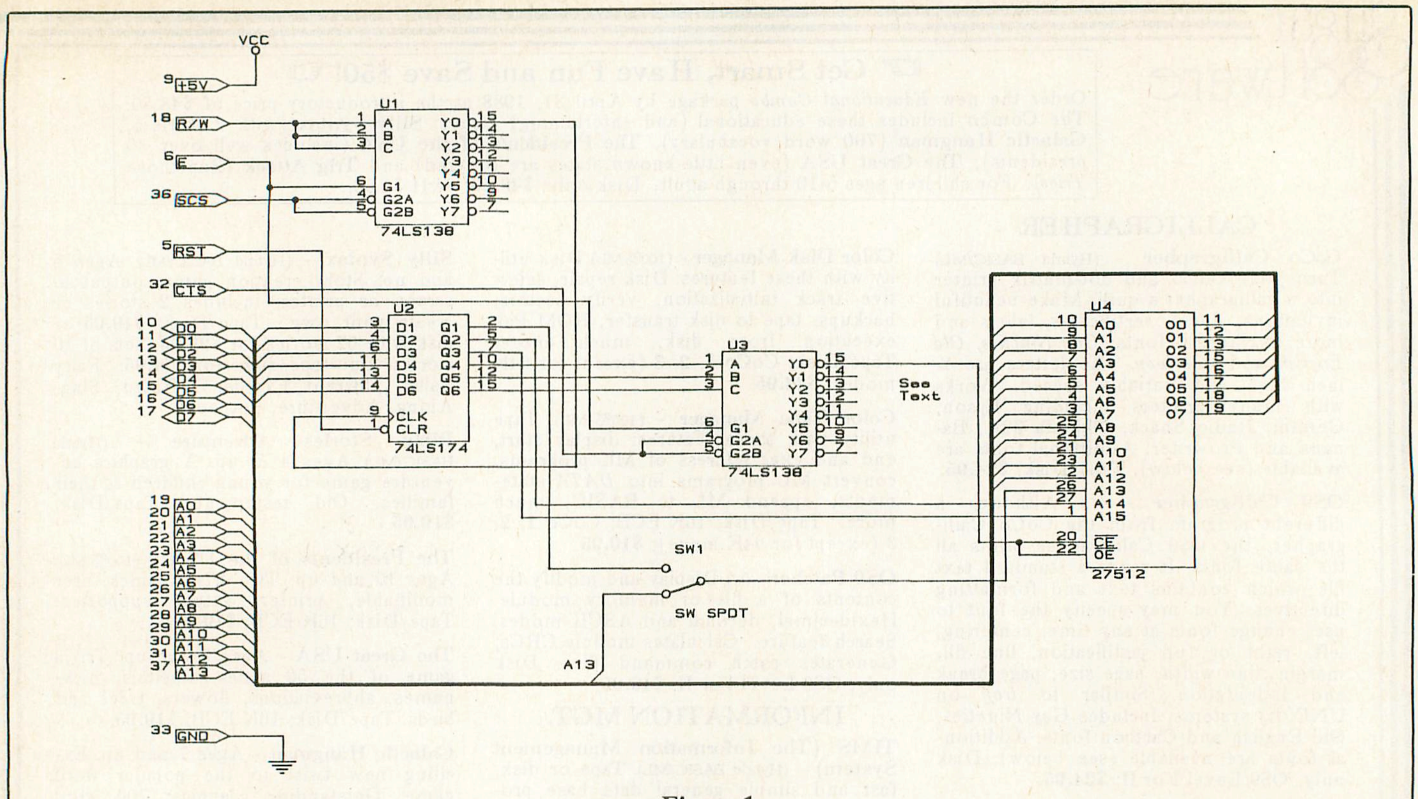

**Figure 1**

The CTS pin is the main select for the external ROM area. The output Y0 is connected to the Chip Enable and Output Enable of U4. Only one EPROM is shown. The other seven EPROMs are all wired in parallel except for these two pins. Y1 to Y7 of U3 connect to pins 20 and 22 of chips U5 to U11, respectively. Wow! What a mouthful! Depending on what the binary number is at the A, B and C inputs of U3, one of the eight EPROMs will be selected when the CTS pin goes low.

Now let's look at the next two bits, Q2 and Q3 of U2. They connect to A14 and A15 of all the EPROMs. If you put on your binary thinking hat, you'll realize A0 to A13 comprise 14 address lines. Two to the power of 14 gives us the amount of data 14 address lines can access — 16K. These two bits that are connected to the EPROMs select four banks of 16K. A 27512 has 64K of memory. These two bits connected to A14 and A15 will divide the 64K EPROM into four banks of 16K. OK, here comes the tricky part. A13 of the EPROMs can be connected to one of two sources via SW1. The way it is connected in Figure 1 is the way it is required to switch 16K banks. Each of the eight EPROMs has four 16K banks; that gives you 32 16K banks of memory.

There is another way to wire things up. When the switch is turned the other way, it no longer gives you 16K banks. With one less address line to work with, the CPU will see two 8K banks mirrored with the same data. By putting this address line to another bit (Q1 of U2), we now have three bits of bank switching. In binary, three bits give you eight banks to choose from. You now have eight EPROMs with eight banks each, which gives you 64 banks of 8K of memory. That's a total of 512K of memory.

Well, that about does it for the theory part. The construction of the ROM disk, like I said before, is a big task. You will need eight 28-pin sockets for the EPROMs and three 16-pin sockets for the other support chips. The best way to go with this one is to get the protoboard from CRC Inc. That is the one I used, and it has plenty of room for all the chips. Also needed for this project are eleven .1 uf capacitors, one for each chip; connect them between +5V and ground as close to each chip as possible. Not shown on the diagram are the +5V and ground pins for these chips. It is simple. For the three TTL chips, the +5V pin is 16 and the ground pin is 8. For the EPROMs, the +5V pin is 28 and the ground pin is 14. That is all you need to know to construct this board.

Now that I've shown you the hardware part of this project, it's time for the software. You all know how much I hate that. But, without software, hardware would not be much good. Though I will not be writing any software, you will need to know something about the hardware to write it yourself. The control byte, as I call it, for which bank is active in this circuit is at $FF40.

There are two different ways the control byte works, depending on which way the switch SW1 is set. The two options are this — 32 16K banks and 64 8K banks. For the option of 64 8K banks, D0, D1 and D2 of the control byte select eight banks per EPROM. D3, D4 and D5 select one of eight EPROMs. So, U4 has bank numbers 0 to 7, U5 has 8 to 15, U6 has 16 to 23, and so on. Each bank will appear from $C000 to $DFFF. The 16K banks are a little different. D0 is not used; D1 and D2 select four 16K banks; and D3, D4 and D5 again select one of eight EPROMs. This time U4 has bank numbers 0 to 3, U5 has 4 to 7, U6 has 8 to 11, and so on.

The choice to use 8K or 16K banks is yours, of course, but think of this: If you use 16K banks, you lose 256 bytes per bank in CoCos 1 and 2 and 512 bytes per bank in CoCo 3 because of the addressing of the CoCo. Those bytes are reserved for I/O.

I hope that I have given you enough information to think about and act on. It is a big project, but for the right people, it can be quite rewarding.

# Database Downloading

### By Cray Augsburg
### Rainbow Technical Editor

Briefly, last month, we covered use of the Mail and Forum areas in the CoCo SIG for the benefit of newcomers. We find that, with the continual influx of new users, we must periodically revisit topics of greater interest.

Most people join Delphi mainly for the purpose of downloading the many fine programs found in the CoCo SIG. It is only after they have used the system that they begin to realize its benefits extend far beyond the databases. They also learn that downloading for the first time can be very frustrating. Many also find that the communications software they have purchased won't allow them to download from online services such as Delphi.

The thrust of this month's column is to help those who have limited experience in downloading from information services. First, we will discuss the software aspects and system requirements. We will then discuss how the database area is organized on Delphi. Next month we will continue our discussion with the procedures involved in downloading files from the CoCo SIG.

**What Software Should I Use?**

Before you can begin telecomputing in the first place, you must have a computer, a modem and the software that allows your computer to act as a terminal. This "terminal software" comes in many shapes and sizes with various flavors to suit just about any taste.

While *Color Compac* and the built-in software in the Deluxe RS-232 Pak (both from Radio Shack) allow you to communicate with online services, neither program is designed to allow you to download programs from such services.

For the purposes of downloading, you will want to purchase a terminal program that supports the Xmodem or Kermit protocols. These protocols use error-checking techniques to ensure error-free downloads. This, of course, will save you time and money.

A host of commercial terminal programs that support Xmodem are available. *Autoterm* from PXE Computing, *Color Connection* from Computerware and the *Datapack* series from Cer-Comp come to mind. Another feature-packed terminal program, intended for the CoCo 3, is *Color Talk 3* from Computize. All of these companies are RAINBOW advertisers. The programs each offer various features that can be very useful to the telecommunicator.

Many people choose to avoid the commercial route until they have gained experience in the telecommunications field. In this way, they can be sure of which features they need before investing a great deal of money in such software. For these people, the "share-

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*Cray Augsburg is RAINBOW's technical editor and has an associate's degree in electrical engineering. He and his wife, Ruth Ann, have two children and live in Louisville, Kentucky. His username on Delphi is CRAY.*

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# Database Report

### By Don Hutchison
### Rainbow CoCo SIG Database Manager

Interest in graphics remains exceptionally high on the CoCo SIG. The graphics topics are already the largest in the database, and user interest never seems to wane. For the second month in a row, the CoCo 3 Graphics topic of the database was the fastest growing area by far.

**OS-9 Online**

In the Utilities topic area, **Ronald Cliborne** (COCORON) uploaded a multiple-directory file utility that can handle directories of more than 250 files and allows several of the most often used commands. **Greg Law** (GREGL) uploaded `IPatch.ar`, which contains two programs written by Bob Santy. `IPatch` can perform a complex patch to a module that includes additions, deletions and simple changes to byte sequences in a file. It is similar to `ModPatch`, but can be used to make a file larger or smaller. Its companion program, `MakPatch`, can be used to compare the original file with a new file and create an `IPatch` script.

**Colin McKay** (COLINMCKAY) uploaded *ModemTime*, a program to read in the time from a Capetronic QT1200 modem and convert it to 24-hour time. **George Janssen** (GBJANSSEN) posted `ScrCpy`, a program that can be used to copy a Type 2 (24-by-80) window to another window, file or the printer. **Richard Esposito** (DOCTORASCII) posted `Save9.BAS`, a disk BASIC program that will create the `SAVE` program Tandy/MicroWare did not include with Level II. (The `SAVE` command was originally written by Kevin Darling and was uploaded with his consent.)

**Kevin Darling** (KDARLING) uploaded an `AR`'ed file of a *Shell+* module and documentation. *Shell+* will replace your current shell on L-II CoCo 3. It features bug fixes, a programmable prompt, shell scripts in your execution directory, allows command line inclusion of parameters for packed BASIC09 programs, and a few other neat things. **Michael Washburn** (COMPZAP) posted *Scan*, a utility for searching disk files for text, codes, etc. Input can be a mixture of Hex, decimal or text strings. **Robert Scott** (ROBERTSCOTT) uploaded `clockon`, an executable command for setting the system clock from the Disto RTime hardware clock adapter. George Janssen posted Version 2.02 of his popular *Pak* archiving utility.

In the Patches topic area, **Dave Philipsen** (DPHILIPSEN) uploaded a file called `Clockpatch.ar`, which contains a patch file to be used with the `IPatch` utility. It creates a new clock module that will keep system time under OS-9 Level II using the Speech Systems Real Time Clock cartridge. Kevin Darling uploaded a patch file from Kent Meyers to fix the two known major bugs in `GShell` from the *Multi-Vue* package.

In the Telecommunications topic area, **Bill Brady** (OS9UGED) posted the documentation file for `BigT` and for Version 5 of `Wizacia`.

In the Graphics & Music topic area, **Christopher Burke** (COCOXT) uploaded an ware" market is the way to go. While there are many entries in this arena, three currently stand out in my mind: *MikeyTerm* by Mike Ward, *Greg-E-Term* by Greg Miller and *Rickeyterm* by Rick Adams. These three programs are available from the authors simply by sending $10 and a blank disk to the appropriate address:

Mike Ward
1807 Cortez
Coral Gables, FL 33134

Greg Miller
9575 Roston Road
Grandledge, MI 48837

Rick Adams
Color Central Software
712 Brett Avenue
Rohnert Park, CA 94928

Ordered
15MAR86

Also, *MikeyTerm* supports tape-based systems — simply include a tape with your $10 instead of a disk.

OS-9 users will be interested in *XCOM9*, a public domain terminal program being distributed by the OS-9 Users Group. Also, *The Wiz* is gaining a lot of attention in the Level II market. This program, from Frank Hogg Laboratory, is very easy to use and takes advantage of the added power offered by Level II.

**The CoCo SIG Databases**

To enter the database area of the CoCo SIG, first get to the `CoCo Sig>` prompt. Then enter `DAT`. The next prompt to appear on your screen will be `TOPIC>?`. You see, the overall database is divided into several smaller databases. This organizational approach helps make finding a specific file that much easier. It can also help to reduce your online time. Just enter the first three characters of one of the following user-accessible topics:

General Information
CoCo 3 Graphics
Source for 6809 Assemblers
Utilities & Applications
Hardware Hacking
Games
Classic Graphics
Music & Sound
Info on Rainbow
Archives
HELP
Product Reviews & Announcement
Rainbow On Tape
Data Communications

You may also get a list while online by entering a question mark (?) at the `TOPIC>` prompt.

When you have entered the topic of your choice, Delphi will whisk you into that particular database. You will see `DBASES:`*xxx*`>` on your screen (the *xxx* represents the first three characters of the particular topic area of the database you have chosen). At this point, you can enter `DIR` or simply press ENTER to get a directory of the chosen database. Each directory entry contains up to 32 characters. Keep in mind you are not necessarily looking at actual filenames. You

article that provides instructions for installing *Multi-Vue* on a hard disk and also included a brief review of *Multi-Vue*. George Janssen uploaded an icon editor for creating, modifying or viewing a 24-by-24 pixel, four-color bit map icon of the type used by `GShell` when running *Multi-Vue*.

**CoCo SIG**

In the General topic of the database, **Kevin Nickols** (NICKOLS) posted the Tandy Newsletter for January. **Marty Goodman** (MARTYGOODMAN) posted a very interesting article about the bar code system used by the U.S. Postal Service. With information from this article, readers can decipher the codes and even generate their own codes using a dot matrix printer. **Rick Adams** (RICKADAMS) posted a collection of humorous quips denoting what Rick terms "diminished mental capacity." For example, one such quip was, "His driveway doesn't run all the way to the street." All jokesters will have to have this file.

In the CoCo 3 Graphics topic area, **Steve Ricketts** (STEVEPDX) uploaded a *CM3* viewer, some *CoCo Max III* pictures and several digitized images. **Mike Andrews** (MANDREWS) posted a printer dump for the DMP-105 that will print DS-69 digitized images. **Richard Trasborg** (TRAS) uploaded 13 complete sets of adult pictures by Mike Trammell. Mike's drawings are always popular. Richard also sent us several digitized shots from the *Star Wars* movies, as well as some of his own adult drawings. **James MacKenzie** (ZIMBO) posted a *Color Max 3* font display utility. **Orman Beckles** (ORMAN) uploaded a video display utility. **John Nichols** (JKNICHOLS) uploaded a double screen viewer utility for *CoCo Max III* pictures. **Gene Clifto** (CEC) provided us with his *MacPaint* dump for the CGP-220. **Cray Augsburg** (CRAY) posted a digitized picture of user **Shannon Yoffe** (SHANNONY), thereby fulfilling a deep-seated fantasy. **Glenn Accardo** (6883SAM) uploaded some fine 16-level digitized *Star Wars* pictures.

**Gregory Clark** (GNOME) uploaded his *Dump16* utility program, which will print an `HSCREEN2` image to a DMP-110 printer. Then **Jason Forbes** (COCO3KID) uploaded an Epson version of Clark's *Dump16* program and a program to display Hilbert curves. Colin McKay provided us with a second modified version of *Dump16*. **Roger Bouchard** (HARBIE) uploaded a text file that describes the file format used by *CoCo Max III* pictures. **David Mills** (DAVIDMILLS) provided a drawing of Miss CoCo done with *Color Max 3*. **Bob Wharton** (BOBWHARTON) uploaded some *CM3* calendar head pictures.

In the Utilities & Applications topic area, David Mills posted an outstanding BASIC program called *Diplomat* that gives information about other countries, their monetary systems, their capitals, etc. **Ken Wuelzer** (WUELZERKEN) posted Version 2.6 of his very popular shareware disk utility, *KDSK*. **Hadley Hazen** (HAZE) uploaded a disk label maker, and then updated it a few days later with Version 2. **Brian Wright** (POLTERGEIST) uploaded an "AutoCopy" utility.

In the Hardware Hacking topic area, Roger Bouchard uploaded text files describing gray scale composite video and another providing valuable information about dynamic RAMs.

In the Games topic area, **Mike Ward** (MIKEWARD) uploaded "immortality" pokes for the popular game *Thexder*, as well as a text file describing how to transfer your *Thexder* ROM pack to disk.

In the Classic Graphics topic area, **George Hoffman** (HOFFBERGER) uploaded a BASIC program that creates the album cover from Pink Floyd's *The Wall*. Jason Forbes uploaded his program to display Hilbert curves, and Brian Wright posted some digitized ladies.

In the Music & Sound topic area, George Hoffman uploaded his rendition of "Pop Goes the World."

In the Product Reviews & Announcements topic area, **Jim Goettig** (JGMG) uploaded his impressions of *Word Power 3*. **Laurence Tepolt** (TEPCO) provided product announcements of his assembly language programming books for the CoCo 1 and 2 and the CoCo 3.

In the Data Communications topic area, Marty Goodman uploaded the revised *RTTY* programs as written by N6LQV. These programs enable the CoCo to send and receive Baudot codes, and are always very popular with amateur radio operators. **Dave Stinson** (UG) uploaded a set of message generator programs for use with the *RTTY* package. **Joe Carney** (JOECARNEY) uploaded a text file describing his testing of uploading and downloading times using both the Ymodem and the Xmodem protocols with Delphi. Mike Andrews uploaded the specifications for the Ymodem protocol.

See you online on Delphi!

are really looking at the descriptive name of a group of files. Each directory entry indicates one group that may contain one or more files.

When you have entered the topic of your choice, Delphi will whisk you into that particular database. You will see DBASES:*xxx*> on your screen (the *xxx* represents the first three characters of the particular topic area of the database you have chosen). At this point, you can enter DIR or simply press ENTER to get a directory of the chosen database. Each directory entry contains up to 32 characters. Keep in mind you are not necessarily looking at actual filenames. You are really looking at the descriptive name of a group of files. Each directory entry indicates one group that may contain one or more files.

After you have found an entry that interests you, find your way back to the DBASES:*xxx*> prompt. If your cursor is not there, usually a simple CONTROL-Z will take you there. If, instead, you wind up at the ACTION> prompt, press CONTROL-Z a second time.

Now that you are back at the prompt, you can get a description of the entry by entering READ *yyyy*, where *yyyy* is the name of the entry from the directory. You will be presented with a brief (usually) description of the chosen group of files. At the bottom will be the ACTION> prompt indicating you can download at this point. Just above that will be the actual filenames. While we don't have enough room this month to get into the actual downloading procedures, I would like to leave you with some idea of what the extensions to those filenames mean.

When Marty Goodman (MARTYGOODMAN) started working in the databases a year or so ago, he proposed a standardization of filename extensions. The result has been a set of meaningful extensions that have changed only to allow room for new developments, *Color Max 3* and *CoCo Max III* files being notable examples. The standard list of allowable extensions and a brief explanation of each is as follows:

BAS — a BASIC program stored in ASCII format.

BIN — binary data or machine language files.

CM3 — a binary picture file for *CoCo Max III*.

DOC — indicates file is an ASCII documentation file for a program.

MGE — a binary *Color Max 3* picture file.

MUS — a binary *Musica* file that can be played with the *Player* utility to be found in the Music database. Music files that can be (C)LOADMed and EXECed will have the .BIN extension.

ORC — an *Orchestra-90/CC* file in ASCII format.

PIX — indicates a picture file that has been converted to an ASCII BASIC program via the *MAXCMP* compressor program. It will create a PMODE4 picture when it is run.

SRC — assembly language source file in ASCII format.

TXT — general text file that doesn't fall under the BAS, DOC, PIX or SRC conventions above.

TOK — a BASIC file that has been stored in tokenized form, also referred to as compressed BASIC. In any event, the file is in binary format and can be downloaded only with an error-checking protocol such as Xmodem.

The importance of the extensions given above will become apparent when we continue with our discussion of the databases next month.

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## KISSable OS-9

### *What's new in the OS-9 sector*

# New Tools, New Toys

**By Dale L. Puckett**
**Rainbow Contributing Editor**

The telephone rang one evening just before Christmas. Tony DiStefano was calling from Canada to tell me his new Super Controller II was ready for release. My copy had been mailed and Tony hoped I would get it before Christmas.

We had talked about this direct memory access disk controller several times in the past year and I couldn't wait to get my hands on it. Tony has also designed many other hardware add-ons for the Color Computer during the past several years, and they all have performed flawlessly. And most importantly, they've been affordable.

The pricing of the Super Controller II is "very competitive," although DiStefano wasn't exactly sure what the final selling price would be. He said the suggested retail price will be $149.95, but he expected the selling price to be much lower. My sources tell me it should come in at a price just below the Sardis controller — the only no-halt controller for the Color Computer presently on the market.

DiStefano's new controller mounts in Slot 4 of your Multi-Pak Interface — just like a Radio Shack controller. In fact, if you don't install Kevin Darling's special device driver, Tony's new controller acts just like a Radio Shack controller. It is completely compatible with the Tandy controller and will run all RS-DOS software right out of the box. It has one ROM socket that can hold either a regular 24-pin chip like that found in the Radio Shack controllers or a 28-pin jumper-selectable EPROM like the 2764 or 217128. You can also plug your Disto parallel printer/real-time clock, hard disk adapter, or RAM disk expansion boards into it.

Tony held the current drain of the controller well below the 300 milliamps recommended by Radio Shack. In fact, it still comes in below Tandy's recommendation even after you add one of the Disto add-on cards.

However, the beauty of this new CoCo hardware cartridge surfaces when you install Darling's `CC3 Disk.irq` device driver in your OS-9 Level II boot file and reboot. DiStefano worked closely with the author of *Inside OS-9 Level II* while he was developing the driver for this controller. It is completely interrupt-driven.

Here's how it works. When the controller issues a read or write command, the data is placed in a memory buffer on the controller card. Then, the controller fires the `irq` and the computer services it to get the data. While the transfer from the disk to the controller is taking place, the computer continues to process other data. Even when the drive needs to step back and forth on the floppy, the computer works away. With this controller, you'll no longer need to stop and wait for a disk operation to be completed before you can go about your business.

The full type-ahead feature that veteran OS-9 users have loved since day one has finally arrived. No longer will you lose a keystroke or two when you type a command line while your disk drives are running. This is a fantastic feature. Once again, Tony DiStefano is to be congratulated.

What's next from Disto? No one knows — not even Tony. However, he does have a lot of things on his CoCo wish list. At the top of that list is a color digitizer that takes the output from a video cassette recorder, processes it and then feeds it into your CoCo. Sounds interesting . . . and useful.

**Games, Too!**

Several days after we talked with Tony, we received *Sub Battle*, a new CoCo 3 game from Epyx — the same submarine simulator that runs on the IBM PC, Apple II and Commodore 64/128 computers. Designed by Digital Illusions and sold by Tandy, it makes OS-9 shine.

Your goal is to command a World War II submarine, complete a mission and survive. As a beginner you can start with some target practice against an enemy convoy and then move on to a single mission game in a real combat setting. When you get brave, you can assume command of the sub and replay

---

*Dale L. Puckett, who is author of* The Official BASIC09 Tour Guide *and co-author, with Peter Dibble, of* The Complete Rainbow Guide to OS-9, *is a free-lance writer and programmer. He serves as director-at-large of the OS-9 Users Group and is a member of the Computer Press Association. Dale is a U.S. Coast Guard lieutenant and lives in Rockville, Maryland.*

actual incidents that took place during World War II. Sixty different missions — 24 American and 36 German — are included in this Simulation.

*Sub Battle* is an excellent graphics game. You navigate your sub by keeping an eye on view, heading and speed gauges. You also have map displays to keep you on track. If the lunch whistle blows, you can save your mission to a file on a floppy disk and reload it later. This game is a lot of fun to play. I particularly like the response you get if you try to raise the periscope while you are submerged: "But you'll drown, Sir!" Try it! It's not just a game; it's an adventure!

### *Multi-Vue* Fix

Last month we urged you to be careful when you name files on a disk that you plan to use with *Multi-Vue*. Quite often, `GShell`, the new graphics shell, will hang up if it encounters a file with a name that ends with a period followed by exactly three characters — unless the three characters used are in a *Multi-Vue* AIF filename.

Kevin Darling jumped on the problem immediately and wrote a program to clear the data memory area used by `GShell` before starting *Multi-Vue*. That improved things a bit, but didn't really solve that problem. Darling continued to pursue the problem with Kent Meyers, hacker extraordinaire, who offered the `ModPatch` script shown in Figure 1. If you're running *Multi-Vue*, it's absolutely essential that you run this script. Store it in a file named `FixGS` in your current data directory. Then type the following command line:

```
OS9: ModPatch <FixGS <ENTER>
```

```
* Kent D. Meyers' Modpatch script that corrects
* two known GShell bugs.
*
* Old CRC= 9E2FB9, new CRC should be= 8E7E71.
*
* Fixes both the three-letter file extension hang bug,
* and lets GShell handle directories with more than 255 files.

l gshell
c 117D  42 2C
c 1838  32 16
c 1839  64 1D
c 183A  0C CC
c 18EF  32 16
c 18F0  62 1D
c 18F1  0A 21
c 3607  EC DC
c 3608  62 30
c 3609  E3 C3
c 360A  A9 00
c 360B  05 01
c 360C  8D DD
c 360D  25 30
c 360E  21 32
c 360F  10 64
c 3610  A3 16
c 3611  A9 E2
c 3612  05 29
c 3613  8F DC
c 3614  24 30
c 3615  1A 83
c 3616  34 00
c 3617  06 01
c 3618  AE DD
c 3619  A9 30
c 361A  05 32
c 361B  8D 62
c 361C  4F 16
c 361D  AC E2
c 361E  E4 D4
v
```

**Figure 1:** `FixGS`

**Getting Organized**

I'm betting that once you start running *Multi-Vue*, you are going to want to get organized. In the low resolution mode, `GShell` displays only 12 documents or folders on your screen. The situation improves somewhat when you use the high resolution mode and can see 24 icons displayed eight columns wide by three rows deep.

We've talked about OS-9's hierarchical directory system and discussed the advantages of keeping a small number of files in each directory. You can save

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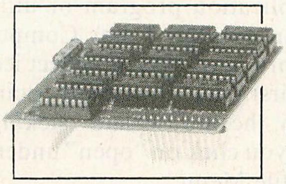

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## Submitting Material To Rainbow

Contributions to THE RAINBOW are welcome from everyone. We like to run a variety of programs that are useful/helpful/fun for other CoCo owners.

**WHAT TO WRITE:** We are interested in what you may wish to tell our readers. We accept for consideration anything that is well-written and has a practical application for the Tandy Color Computer. If it interests you, it will probably interest lots of others. However, we vastly prefer articles with accompanying programs which can be entered and run. The more unique the idea, the more the appeal. We have a continuing need for short articles with short listings. These are especially appealing to our many beginners.

**FORMAT:** Program submissions must be on tape or disk, and it is best to make several saves, at least one of them in ASCII format. We're sorry, but we do not have time to key in programs and debug our typing errors. All programs should be supported by some editorial commentary explaining how the program works. We also prefer that editorial copy be included on the tape or disk using any of the word processors currently available for the Color Computer. Also, please include a double-spaced printout of your editorial material and program listing. Do not send text in all capital letters; use upper- and lowercase.

**COMPENSATION:** We do pay for submissions, based on a number of criteria. Those wishing renumeration should *so state* when making submissions.

For the benefit of those who wish more detailed information on making submissions, please send a self-addressed, stamped envelope (SASE) to: Submission Guidelines, THE RAINBOW, The Falsoft Building, P.O. Box 385, Prospect, KY 40059. We will send you comprehensive guidelines.

Please do not submit material currently submitted to another publication.

a lot of time if you do that. It takes just under five seconds to redraw the screen each time you scroll from one screen-full of document icons to another while browsing through a directory folder. You will find it easier to get to your documents and application programs if you store just one screen-full in each directory.

There's no question about it — running an application program or utility by double-clicking the mouse button while pointing to an icon is much more enjoyable than remembering a long pathlist to the file that holds your program. Before you can do this, however, you'll need to prepare application information files — AIFs — and icons for the utilities you use most often.

Here's the quick and dirty way to get started. For now, ignore the fact that you don't have an icon editor. You do have an icon you can use — it's stored in a file named `Icon.demo` in the `ICONS` directory of your original system disk from Tandy.

Since the icon attached to any particular application program or document is defined in the application information file, it really doesn't matter that you have only one icon. You can write an AIF file that points all of your programs and utilities to the same icon. You'll still be able to tell your programs apart, however, because the name of the program in each AIF file will appear below each icon.

Later you'll want to download a copy of a public domain icon editor for *Multi-Vue*. You'll find one in the database section of RAINBOW's OS-9 Online SIG on Delphi and on CompuServe's OS-9 SIG. The icon editor will let you make your own icons for your applications. By the way, you'll want to store all of your icons in the same place. A directory named `ICONS` in your current execution directory, `CMDS`, is the most appropriate place for this directory.

Many people have already started to work on a set of icons for their favorite OS-9 applications, and you'll find several files full on the commercial databases mentioned above. Once you have downloaded these files, you can modify them with the icon editor to suit your own taste or simply use them with your own applications and documents.

For example, after I downloaded an icon named `icon.tsword` from the OS-9 SIG last week, I noticed that it pictured an old-fashioned quill and a bottle of ink. I immediately thought it would make an excellent icon for *DynaStar*, so I quickly set up an application information file named `Aif.dsa` to put it to work. Here is a listing of that file:

```
ds

icons/icon.tsword
96
2
80
24
3
2
```

The next time I double-clicked on the directory where I had stored `Aif.dsa`, an icon with a quill and ink bottle appeared with the letters `ds` below it. *Multi-Vue* had automatically read the file `Aif.dsa` and learned that the name of the application I wanted to run was named `ds`.

Later when I double-clicked that icon, *Multi-Vue* read the file `Aif.dsa` again and told OS-9 that I wanted to run a program named `ds`. It assumed that I had stored `ds` in my current execution directory. Further, it tells OS-9 that I do not want to pass any additional parameters when `ds` is started.

*Multi-Vue* found the icon it displayed in a file named `icon.tsword`. That file had its execute and public execute bits set and was stored in a directory named `ICONS`, which I had created in `CMDS`, my current execution directory.

When *Multi-Vue* read the fourth line of the file `Aif.dsa`, it learned that I wanted OS-9 to start *DynaStar* with 96 pages — 24K — of memory. In the next three lines it learned that I wanted OS-9 to start *DynaStar* in an 80-by-24, Type 2 window. The last two lines tell OS-9 to display black letters on a green background. A Type 2 window is configured to display text only and runs much faster than a graphics window.

To get to this point, `GShell` — your visual interface to OS-9 — followed a precise sequence of events.

When it first reads the name of a file, it checks to see if it is a directory. If so, it displays a folder on your screen. If the file is not a directory, it checks its attributes to see if it contains executable code. If it does, it displays an object icon that visually tells you the file contains an application program or utility you can run on your Color Computer. To run a program with an object icon, you must first select the icon by pointing to it with the mouse and clicking once. Then, you click on "open" under *Multi-Vue*'s file Menu.

If the file checked is not a directory and not executable, it can only contain data. However, that data can take any form. For example, it may simply be a text file you created with *DynaStar* . . . or a program source file you created with BASIC09. However, it may also contain information that can help *Multi-Vue* automate your Color Computer.

If, for example, a file's name is `aif.` followed by any three characters that form a legal OS-9 filename, `GShell` knows that it contains an application information file. Likewise, if the name of a file ends with a period followed by three letters that have been previously used in an application information file, then `GShell` knows that it is a data file created by the application program named in that AIF file. Let's take a closer look at this last condition.

Earlier we mentioned that we had described an application information file named `Aif.dsa`. If we later save a *DynaStar* file with a filename that ends in `.dsa`, then `GShell` will know that it was created by *DynaStar.* If we double-click the mouse button while pointing to this file's icon, it will start *DynaStar* and automatically open our document for editing. Give it a try!

To keep from getting confused, there's an important thing you should note here. If you create a new file with *DynaStar* named `MVTester.dsa`, it will not appear on the screen that displays your current data directory until `GShell` reads that directory again. To check this out, I created a file named `MVTester.dsa` and saved it in my current data directory. Then I closed *DynaStar* to return to *Multi-Vue.* I did not see my new file.

Suspecting this would be the case, I clicked on another drive and displayed the documents in its root directory. When I moved back to my original data directory — presto, the new file was in place and was marked by the quill and ink bottle icon. Just to make sure everything was working, I double-clicked on it. A second later, *DynaStar* was running and the file `MVTester.dsa` was ready for editing. It passed the test.

If you have applications like *DynaStar* and BASIC09 that you run often, you'll probably want to load them into memory in your "start-up" file so they'll be there instantly when you double-click.

When `GShell` checks a data file and does not find an AIF-file or a data file created by an AIF-driven application, it displays that file as a simple document. You can find out what's in that document by selecting it with your mouse and acting on it with any of the active verbs under the *Multi-Vue* file menu.

### About the Clipboard

Those of us who use other computer systems at work that provide a clipboard for cutting and pasting within and between application programs have looked forward to *Multi-Vue*'s release for a long time. We were surprised to see that *Multi-Vue*'s `GShell` did not make use of the clipboard capability that had been designed into the heart of the system. It is, however, the job of the application programmer to provide the clipboard capability within his or her program.

Before we get to the point where we can cut data from one application and paste it in another, we must develop a set of standards that every application programmer should follow. To this end, Tandy has come up with a set of suggestions they hope all application vendors will follow. If the vendors don't follow this lead, we will all suffer. Incompatibility problems will then prevent our Color Computers from reaching the performance goals we seek.

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You may also contact D. P. Johnson (see left) to answer your technical questions about the DISKMASTER system.

## About The One-Liner Contest . . .

THE RAINBOW's One-Liner Contest has now been expanded to include programs of either one or two lines. This means a new dimension and new opportunity for those who have "really neat" programs that simply just won't fit in one line.

*Here are the guidelines:* The program must work in Extended BASIC, have only one or two line numbers and be entirely self-contained — no loading other programs, no calling ROM routines, no poked-in machine language code. The program has to run when typed in directly (since that's how our readers will use it). Make sure your line, or lines, aren't packed so tightly that the program won't list completely. Finally, any instructions needed should be *very* short.

Send your entry (preferably on cassette or disk) to:

**THE RAINBOW**
**One-Liner Contest**
**P.O. Box 385**
**Prospect, KY 40059**

The first thing your application program must do is highlight the clipboard option under the hourglass on the menu bar. When you do this you are telling the user that he may select a portion — or all — of his data using the mouse and then click on the clipboard option under the hourglass where he can act on his data with the active verb of his choice. When he clicks on the word *clipboard* he will see the dialogue box below.

```
<<<<CLIPBOARD>>>>

COPY
CUT
MERGE
PASTE

VIEW
QUIT
```

The View option above lets the user see the data code and its extension so he can determine if he wants to replace an existing clip file with new data.

Copy and Cut will delete an existing clipboard file and write a new file. Merge adds more data to the clipboard file. It is up to the application programmer to ensure that it is the same type of data.

Paste inserts the data in the clipboard file into the application's data space at the position pointed to by the cursor. Quit exits the clipboard function without changing anything. After you paste some data into an application, the clipboard function returns control to the application program. If no clip file exists, your program must be smart enough to know it and warn the user.

When the user selects Cut or Copy, your program should take the selected data and write it to a file named `/DD/Clip_#`. The pound sign (#) represents the user ID of your application program's process. The file should contain a two-character Hex representation of the data type you are putting in the clipboard, a period and three-letter code that tells the origin of the data, plus one space and a carriage return without a line feed. The data you are saving to the clipboard follows this standard prefix. A typical clipboard file that uses this format is listed below:

```
(03)(VEF)(#0D) . . . DATA . . .
[EOF]
```

Tandy has proposed the following code definitions, which I propose we all start using now so we'll have a standard right from the start:

```
00=ASCII
01=Binary
02=Windows Draw file
03=VEF file
04=GIF file
05=RLE file
. . .
06 - $FF = undefined
```

If your application program generates a unique data type, you can assign any code above 06 to it. If you do this, you will want to publish that code in your documentation and post it on the OS-9 forums on CompuServe, Delphi and GEnie so everyone else can avoid using the same number.

### They Call It *Shell+*

There's really good news for dedicated Color Computer 3, OS-9 Level II hackers in the CompuServe and Delphi OS-9 SIGs these days. Kent Meyers, Kevin Darling and Ron Lammardo have joined forces to create *Shell+* — a replacement for the original Tandy/Microware OS-9 *Shell*.

This program includes fixes to bugs in the original *Shell* and many new features. It is super. These guys are to be congratulated.

*Shell+* will now unlink the proper name. If the module name a program was trying to unlink did not match the command filename you typed when using the original *Shell*, it would stick in memory until you manually unlinked it. *Shell+* fixes this by reading in the actual module name instead of the name on the command line.

The new *Shell* also prevents you from attempting to execute a write-only device as a procedure file and helps you start up Level II windows by writing a null to the standard output path when you run it. You can now also redirect the standard and error output paths to a write-only device. The old *Shell* tried to open the path in the `UPDATE` mode. The "quote" bug has been fixed also, so if you leave off the second quote mark in a command line, *Shell+* will not crash.

The exciting news about *Shell+* is substantiated when you look at the additions. For example, when you work in a windowing environment like OS-9 Level II, it is very easy to forget which window you are working in. To solve the problem, type this line: `p=OS9[@]:`.

After you type it, *Shell+* will append the name of the window you are using, and your new OS-9 command prompt will look like this: `OS9[W7]:`. If you would rather know the process number, you can type `p=OS9[#]:`, and then you will see `OS9[06]:`.

Of course, the `06` will change as the number of your process changes. With *Shell+*, your prompt can be up to 21 characters long.

Global procedure files — *Shell* scripts — can be placed in your execution directory when you are using *Shell+*. To use this feature, take a procedure file you use all the time and copy it to `CMDS`. Then set the execute and public execute bit with the `ATTR` utility. This feature makes it easy for you to add some commands that you use often.

The shell search path for *Shell+* is memory, execution directory modules/scripts, data directory scripts. Here's a sample *Shell+* script that Kevin Darling uses to start *Flight Simulator*:

```
xmode /w6 type=1 ; display c >/
w6
chd /dd/games/fs
(fs <>>>/w6 ;xmode /w6
type =80)&
```

This procedure file opens a VDG-type screen on Window /W6 and starts *Flight Simulator*. When you exit *Flight Simulator*, it resets /W6 to a graphics window. All of this is done in the background.

A new feature that lets you append or overwrite a file moves our Color Computer OS-9 Level II closer to OSK and Unix. Now you can append the output of a program to a file by typing `OS9: merge this that theother >+ OldFile`.

If you type >- instead of >+, you cause *Shell+* to overwrite the contents of the original file. The + and - operators also work with the standard error output path . . . or both. This means you can also use >>+ and >>>+.

All of these new features are great, but we've saved the best for last: *Shell+* lets you execute RunB programs from the OS-9 command line without typing the parentheses and quotation marks. For example, here's the old and new command lines I use to start *Wiz*:

```
OS9: Wiz ("Delphi")
OS9: Wiz Delphi
```

Take your pick. Download this program and use it! But don't forget to tell these guys how great it is so they will keep adding new features. They're already talking about *Shell* variables, Go scripts, Command structures, in-memory *Shell* scripts and an environment. Fantastic!

**More Good News**

If you need a fourth-generation database application like *Sculptor* but are on a budget, we have good news. MPD USA was sued by MPD in London and Frank Hogg at FHL was able to pick up hundreds of copies of *Sculptor* at an outstanding price. Until he runs out, you can buy *Sculptor* for the Color Computer for $149.95 — that's half the standard FHL price and far below the program's $450 list. However, when this shipment is sold, this price is history. If you need this application, act now.

***WordPak RS* Drivers for CoCo 3**

We can't thank Dennis Skala of Fairview, Pennsylvania, enough for his help during our OS-9 seminar at RAINBOWfest Princeton. He ran the computer and performed a live demonstration of OS-9 Level II windows while we told how to create them. It added a lot to the presentation.

We often get requests for device drivers and, once again, Dennis has answered the call. Last year we published his RAM disk drivers for the "Banker." If you have graduated to the Color Computer 3 but still have a *WordPak RS* lying around, you'll thank Skala for these drivers that will bring your 80-column monochrome display back to life. If you're trying to learn how to write a device driver for OS-9, study Skala's excellent code.

Skala wanted to use the existing `co80` subroutine module, so he wrote a small driver that emulates the functions of the Level I `CCIO` driver. His *WordPak RS* works fine at the 2 MHz clock rate used by the Color Computer 3. However, he did need to add a software delay at one point in the `co80` subroutine. He supplies a procedure file that you can use with *Debug* to make the changes. You will need to load `co80` into memory by itself so there will be room for the extra 16 bytes added by his patch.

Skala thinks that you may also be able to get your old *WordPak I* or *WordPak II* to work with these drivers if you make a hardware modification to clear up an addressing conflict with the Color Computer 3. His drivers support all of the CoCo 3 display commands except "underline," "blinking," "insert a line" and "delete a line." All relevant "set status" and "get status" codes are supported. The driver assumes `co80` is

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already in memory and will not autoload it like CC1O.

The listing of wp.dd is the device descriptor. Wecho is a device descriptor that lets you use the *WordPak* as a window device. You use it with the following code sequence:

```
iniz wecho wp
wcreate /wecho -s=2 0 0 80 24 1 0 0
shell </wecho>>>/wp&
```

The only "gotcha" is the fact that the terminal pause and CTRL-W functions will not work with this configuration. Otherwise, you are home free. After you have assembled Dennis' driver, descriptors and subroutine module, you can experiment with them by typing the following:

```
chd /d1
merge wpdrv.dr wp.dd co80 wecho.dd >wptest
attr wptest e pe
load /d1/wptest
link wp
link co80
link wecho
iniz wp wecho
```

If everything performs the way you want it to, you can use OS9Gen or Config to move these modules into your OS9Boot file. If you have any questions, Skala invites you to send them to him along with an SASE at 5423 W. Sebago Drive, Fairview, PA 16415.

**Packet Radio**

Add another sin to the list. Several years ago, George Dorner, the treasurer of the OS-9 Users Group kept telling me about packet radio on the amateur radio bands. He's right — it's fascinating. It's like being on CompuServe or Delphi without paying an hourly fee. Besides that, it's fun. There's a wealth of information waiting for you on amateur radio bulletin boards. Get your license and go for it.

If you're looking for OS-9 software for packet radio, I understand that Dwayne Bruce, VE3FXI, at 29 Vanson Avenue, Nepean, Ontario, Canada K2E 6A9, will send you the C source code for his *WORLI* compatible bulletin board program if you send him a 5¼-inch disk. Check it out. His code could even help you set up a regular telephone-driven BBS system. Tell him to send any comments to me, K0HYD, @ K4QQ. If you're a ham and active on packet

**Listing 1: CO80.patch**

```
* This is a script file to use debug to patch the co80 subroutine for the
*    Wordpak RS.  This is written to patch edition #2, length = $0295,
*    CRC = $C4F197.  Load this version of co80 into memory before using.
*    If using level II, make sure there is room in back of the module for
*    the additional length.  Use debug which has been patched for correct
*    operation under level II;  or patch using level I OS-9.
*
tmode .1 -pause
-p -x -t
debug
l co80
. .+03
$* This lengthens the module by $10 bytes.
ex
= A5
l co80
. .+08
$* This corrects the header parity for the new length.
ex
= 5C
l co80
. .+1D
$* This changes the cursor to a blinking underline.  The second character
*   is the starting line of the cursor - e.g. a value of $60 would
*   result in a blinking block cursor; a value of $65 in a blinking half
*   block cursor, etc.  Using a zero for the first digit will result in
*   a non-blinking cursor.   N.B.  changing this in this file will make
*   the given CRC value incorrect.
ex
= 69
l co80
. .+21F
$* This is the branch to the new code.
ex
= 00
= 74
l co80
. .+278
$* This corrects an apparent typo in the original ( LDA -> LDB )
ex
= C6
l co80
. .+281
$* This patches the existing code to restore the proper cursor
*   on receipt of a $5,$21 sequence
ex
= 0A
= 81
= 2A
= 2E
= 0D
= E6
= 8D
= FD
= 93
= 20
= 02
= C6
= 20
= 86
= 0A
= ED
= D8
= 01
= 5F
= 39
$* The following is additional code to introduce a hardware-controlled
*   delay after a clear-to-end-of-screen.
ex
= 17
= FE
= 6E
= C6
= 20
= E5
= D8
= 01
```

```
 = 27
 = FB
 = 16
 = FE
 = 3F
$* This is the new CRC value
ex
 = 8E
 = 1C
 = 1E
Q
tmode .1 pause
```

radio, I'll be looking for your traffic there also.

Another good contact for you may be John Alan Lind, KD7XG, the Orange Section technical coordinator of the American Radio Relay League. He told me last February that he was porting the WA7MBL packet BBS system into OS-9 C for the CoCo. Give him a try, also. If you contact him, tell him to let me know the status of his BBS.

Till May, 73's & CUL! ☐

**Listing 2:** `wpdrv.dr`

```
************************************************
*                                              *
*      Device driver for Wordpak RS            *
*                                              *
*       For use with Level II OS-9             *
*                                              *
*      Copyright 1987  by Dennis Skala         *
*            all rights reserved               *
*                                              *
************************************************

 NAM WpDrv
 TTL Level II device driver for Wordpak RS
 IFP1
 USE /D0/DEFS/OS9DEFS
 USE /D0/DEFS/SCFDEFS
 ENDC

* Note - USE /D0/DEFS/OS9DEFS AND
*        USE /D0/DEFS/SCFDEFS STATEMENTS ARE
*        INCLUDED BETWEEN IFP1 & ENDC

 MOD WPSIZ,WPNAM,TYPE,REVS,START,SIZE
TYPE SET DRIVR+OBJCT
REVS SET REENT+1
 FCB UPDAT. mode byte - read will be error
WPNAM FCS /WpDrv/
EDITION FCB 1

**** EQUATES ****

CO80FLG   EQU $04 offset for jump address
CC3BELL   EQU $1017 address of cc3io bell routine

**** THE FOLLOWING ARE OFFSETS INTO THE MEMORY AREA ****

*    These are chosen to conform to the co80 subroutine

COUNT     EQU $25 character count for multi-character sequences
MULTIADR  EQU $26 jump address for multi-write
MULCHAR2  EQU $28 third character in multi-character sequence
MULCHAR1  EQU $29 second  "     "      "        "       "
ROWCOL    EQU $2D columns, rows
CHAR      EQU $52 single character or status code here
JMPADR    EQU $72 entry to co80 subroutine

**** DIRECT PAGE VARIABLES ****

SYSPROC   EQU $4A system process descriptor
CURPROC   EQU $50 current process descriptor

**** DRIVER MEMORY AREA ****

          RMB $7C
SIZE      EQU .

CONAME FCC "co80" co-module name
 FCB $0D cr

START LBRA INIT
 LBRA READ
 LBRA WRITE
 LBRA GETSTA
 LBRA SETSTA
 LBRA TERM

************************************************
* INIT ENTRY: U = ADR. OF DEVICE MEM. AREA
*                 Y=  ADR. OF DEVICE DESCRIPTOR
*        EXIT: NO CONDITIONS
************************************************

INIT CLRA
 LEAX $1D,U clear memory from $1D
 LDB #$5D to $7A
INIT.1 STA ,X+
 DECB
 BNE INIT.1
 LDA #CO80FLG to test if already linked
 LDX #$5018 columns, rows
 PSHS A,X,Y,U
 BSR COSETUP
 PULS A,X,Y,U
 BCS INIT.2 if error
 STX ROWCOL,U
INIT.2 RTS exit

COSETUP BITA $70,U do setup, A = parity
 BEQ COSET.1 not already set up
 CLRB no error
 RTS

COSET.1 LEAX CONAME,PC pointer to comodule name
 PSHS A,X,Y
 LDD <CURPROC save current process pointer
 PSHS D
 LDD <SYSPROC make system process current
 STD <CURPROC
 BSR LINKIT link the comodule
 PULS D
 STD <CURPROC restore current process
 BCC COSET.2 if linked successfully
 LEAS 5,S clean stack
 LBRA NF.ERR report error
COSET.2 LEAX JMPADR,U
 LDA ,S should be 4 here
 STY A,X comodule entry point address
 PULS A,X,Y clean stack
 CLRB flag init jump
 BRA COJMP jump to comodule initialization

LINKIT PSHS U link the comodule
 LDA #SYSTM+OBJCT subroutine comodule
 OS9 F$LINK
 PULS U,PC

************************************************
*   READ IS ILLEGAL OPERATION
************************************************

READ COMB set carry
 LDB #$CB illegal mode
 RTS
```

```
*******************************************************
* WRITE ENTRY: U = ADR. OF DEVICE MEM. AREA
*              Y = ADR. OF PATH DESCRIPTOR
*              A = CHARACTER TO WRITE
*        EXIT: NO CONDITIONS
*******************************************************

WRITE LDB COUNT,U
 BNE WR.MULTI if multi-character sequence
 STA CHAR,U single character
 CMPA #'  is it control character?
 BHS WR.CHAR no
 CMPA #$1E $1E or $1F?
 BHS WR.ESC yes
 CMPA #$0F $0F - $1D?
 BHS READ no graphics codes permitted
 CMPA #C$BELL
 BNE WR.CHAR not bell
 JMP [CC3BELL] will RTS from there

WR.CHAR LDD #$100*CO80FLG+3 write single character
COJMP LEAX JMPADR,U
 LDX A,X get comodule execution address
 BEQ NF.ERR if not there
 LDA CHAR,U single character
 JMP B,X jump to comodule write

WR.ESC BEQ TERM ignore $1E
 LEAX WR.CHAR,PC jump address
 LDB #1 prepare for escape code
 STX MULTIADR,U
 STB COUNT,U

*********************************************************
* TERM ENTRY: U = ADR. OF DEVICE MEMORY AREA
*       EXIT: NO CONDITIONS
*********************************************************

TERM CLRB no error
 RTS

*********************************************************

WR.MULTI CMPB #2 need another?
 BEQ WR.M1 yes
 STA MULCHAR1,U stash character
 CLR COUNT,U no more needed
 JMP [MULTIADR,U] do multi character sequence
WR.M1 STA MULCHAR2,U stash character
 DEC COUNT,U one more needed
 CLRB
 RTS

*********************************************************
* GETSTA ENTRY: U = ADR. OF DEVICE MEMORY
*                 Y = ADR OF PATH DESCRIPTOR
*                 A = STATUS CODE
*           EXIT: CONDITIONS DEPEND ON STATUS CODE
*********************************************************

*** Only screen size call supported here

GETSTA STA CHAR,U stash status code
 LDX PD.RGS,Y caller's stack
 CMPA #SS.SCSIZ is it get screen size?
 BEQ SCRSIZ yes, do it
 CMPA #$92 monitor type call?
 BNE GS.JMP no, jump to comodule
 CLR R$X,X return monochrome code in X
 CLR R$X+1,X
 RTS

SCRSIZ CLRA
 LDB ROWCOL,U
 STD R$X,X no. columns in X reg.
 LDB ROWCOL+1,U
 STD R$Y,X no. rows in Y reg.
 CLRB no error
 RTS

GS.JMP LDD #$100*CO80FLG+6 flag comodule getstatus jump
 BRA COJMP do it

*********************************************************
* SETSTA ENTRY: U = ADR. OF DEVICE MEMORY
*                 Y = ADR OF PATH DESCRIPTOR
*                 A = STATUS CODE
*           EXIT: CONDITIONS DEPEND ON STATUS CODE
*********************************************************

SETSTA STA CHAR,U stash status code
 CMPA #SS.COMST set baud, etc.?
 BEQ TERM yes, ignore it
 CMPA #$29 undocumented status code - window stuff
 BEQ TERM ignore it
 LDD #$100*CO80FLG+9 flag comodule setstatus jump
 BRA COJMP do it - will be $D0 error

*********************************************************

NF.ERR COMB set carry
 LDB #$DD module not found
 RTS


 EMOD
WPSIZ EQU * module size
 END
```

**Listing 3:** `wp.dd`

```
 *******************************************************
 *                                                     *
 *        Device descriptor for Wordpak                *
 *         For use with Level II OS-9                  *
 *                                                     *
 *       Copyright 1987  by Dennis Skala               *
 *          all rights reserved                        *
 *                                                     *
 *******************************************************

  NAM Wp
  TTL Level II device descriptor for Wordpak
  IFP1
  USE /D0/DEFS/OS9DEFS
  USE /D0/DEFS/SCFDEFS
  ENDC

  * Note - USE /D0/DEFS/OS9DEFS AND
  *        USE /D0/DEFS/SCFDEFS STATEMENTS ARE
  *          INCLUDED BETWEEN IFP1 & ENDC

 MOD WPSIZ,WPNAM,TYPE,REVS,FMAN,DEVDRV
TYPE SET DEVIC+OBJCT
REVS SET REENT+1
 FCB UPDAT. mode byte - read will be error
 FCB $07 hi address byte
 FDB $FF76 device address
 FCB WPNAM-*-1 initializtion table size

* Initialization table

 FCB $00 device class = SCF
 FCB $00 upper & lower case
 FCB $01 erase on backspace
 FCB $00 backspace over line
 FCB $01 echo on
 FCB $01 auto line feed on
 FCB $00 end of line null count
 FCB $01 pause enabled
 FCB $18 lines per page
 FCB $08 backspace character
 FCB $18 delete line character
 FCB $0D end-of-record character
```

```
     FCB $1B end-of-file character
     FCB $04 reprint line character
     FCB $01 duplicate last line character
     FCB $17 pause character
     FCB $03 interrupt character
     FCB $05 quit character
     FCB $08 backspace echo character
     FCB $07 line overflow (bell) character
     FCB $02 initialization value (parity, type)
     FCB $00 baud rate (unused)
     FDB WPNAM attached device name offset
     FCB $00 xon unused
     FCB $00 xoff unused
     FCB $50 no. columns for display
     FCB $18 no. rows for display
```

```
 FCB $00 window number unused
 FCB $00 rest is invalid

 FDB $00 6 empty bytes for
 FDB $00 window parameters
 FDB $00

WPNAM FCS /Wp/ device name
EDITION FCB 1
FMAN FCS /SCF/ file manager
DEVDRV FCS /WPDRV/ device driver

 EMOD
WPSIZ EQU * module size
 END
```

**Listing 4:** `wecho.dd`

```
**************************************************
*                                                *
*       Device descriptor for Wecho              *
*     a term device which echos to /wp           *
*                                                *
*       For use with Level II OS-9               *
*                                                *
*      Copyright 1987  by Dennis Skala           *
*            all rights reserved                 *
*                                                *
**************************************************

 NAM Wecho
 TTL Level II device descriptor for window device which echos to /wp
 IFP1
 USE /D0/DEFS/OS9DEFS
 USE /D0/DEFS/SCFDEFS
 ENDC

* Note - USE /D0/DEFS/OS9DEFS AND
*        USE /D0/DEFS/SCFDEFS STATEMENTS ARE
*        INCLUDED BETWEEN IFP1 & ENDC

 MOD TERMSIZ,TERMNAM,TYPE,REVS,FMAN,DEVDRV
TYPE SET DEVIC+OBJCT
REVS SET REENT+1
 FCB UPDAT. mode byte - read + write access
 FCB $07 hi address byte
 FDB $FFAD device address matches window number
 FCB TERMNAM-*-1 initialization table size

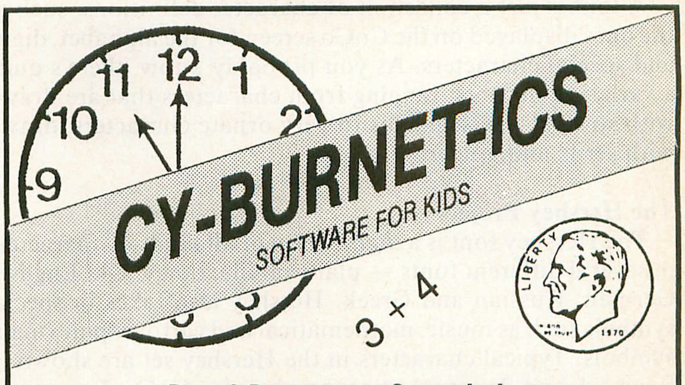
* Initialization table

 FCB $00 device class = SCF
 FCB $00 upper & lower case
 FCB $01 erase on backspace
 FCB $00 backspace over line
 FCB $01 echo on
 FCB $01 auto line feed on
 FCB $00 end of line null count
 FCB $01 pause enabled
 FCB $10 lines per page
 FCB $08 backspace character
 FCB $18 delete line character
 FCB $0D end-of-record character
 FCB $1B end-of-file character
 FCB $04 reprint line character
 FCB $01 duplicate last line character
 FCB $17 pause character
 FCB $03 interrupt character
 FCB $05 quit character
 FCB $08 backspace echo character
 FCB $07 line overflow (bell) character
 FCB $80 initialization value (parity, type)
 FCB $00 baud rate (unused)
 FDB WPNAM attached device name offset
 FCB $00 xon unused
 FCB $00 xoff unused
 FCB $50 no. columns for display
 FCB $18 no. rows for display
```

```
 FCB $0D window number = $0D
 FCB $01 rest is valid - use as defaults
 FCB $02 window type 2 = 80 col text
 FCB $00 X start
 FCB $00 Y start
 FCB $01 foreground palette
 FCB $00 background palette
 FCB $00 border palette

TERMNAM FCS /Wecho/ this device's name
EDITION FCB 1
FMAN FCS /SCF/ file manager
DEVDRV FCS /cc3io/ device driver
WPNAM FCS /Wp/ echo device is wordpak

 EMOD
TERMSIZ EQU * module size
 END
```



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## Barden's Buffer

# Hands-On Hershey

### By William Barden, Jr.
**Rainbow Contributing Editor**

Besides this column in RAINBOW, I write a regular column for RAINBOW's sister publication, PCM, The Personal Computer Magazine for Tandy Computer Users. Believe it or not, Tandy MS-DOS system owners are not bad people. Thanks to their efforts, you're about to receive a gift — as a matter of fact, 1377 gifts. . . .

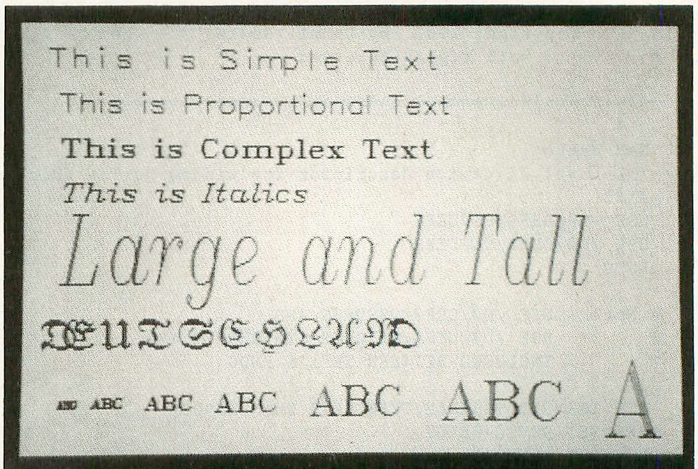
Let me explain. Back in the December 1987 and January 1988 PCM columns, I described a font utility and font driver program that worked in conjunction with a public domain font set called the Hershey font.

A font is just a collection of character definitions, such as the ones displayed on the CoCo screen for the alphabet, digits and special characters. As you probably know, there's quite a variation in fonts, ranging from characters that are drawn with straight line segments to very ornate characters, drawn with serifs and gingerbread.

**The Hershey Project**

The Hershey font is a *digitization* of all kinds of characters in several different fonts — plain vanilla, fancy, Old English, German, Russian and Greek. Hershey also takes in special symbols such as music, mathematical and cartographic (map) symbols. Typical characters in the Hershey set are shown in figures 1 and 2, actual photographs of a CoCo 3 screen in high resolution (640-by-192) mode.

The Hershey characters were created by Dr. Allen V. Hershey, of the U.S. Naval Weapons Laboratory, in the late 1960s. Unlike typical computer characters, which are bit-mapped, the Hershey characters were designed for vector devices such as COM (Computer Output on Microfilm) and plotters. Figure 3 shows the difference between a bit-mapped character used on the CoCo 3 and the corresponding Hershey character.



This is Simple Text
This is Proportional Text
This is Complex Text
This is Italics
Large and Tall
ABC ABC ABC ABC ABC ABC A

Figure 1

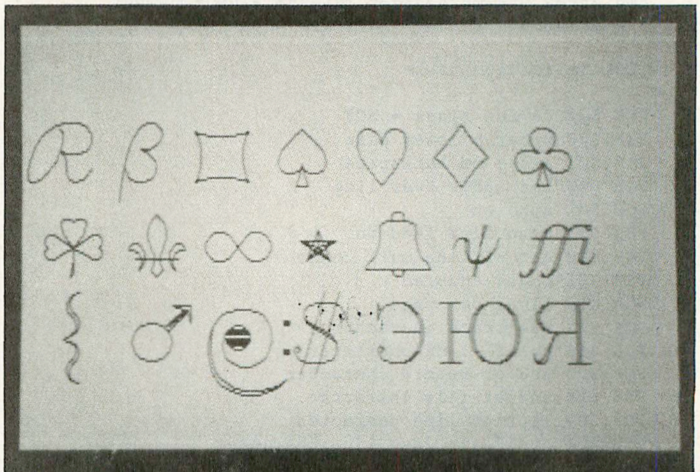


Figure 2

The beauty of the Hershey characters is that they can be drawn on the CoCo and PC-compatible systems by using the BASIC `DRAW` command (which draws a line segment between any two points on the screen) rather than by setting a matrix of bits on and off. Since `DRAW` involves a line between two points, scaling can easily be done — characters can be made larger or smaller without the "blockiness" that results from expanding a bit-mapped character (see Figure 4).

Although it's possible to buy a mainframe magnetic tape in ASCII or BCD format that provides the characters, I suggested to the readers of PCM that they might like to help

---

*Bill Barden has written 27 books and over 100 magazine articles on various computer topics. His 20 years' experience in the industry covers a wide background: programming, systems analysis and managing projects for computers ranging from mainframes to micros.*

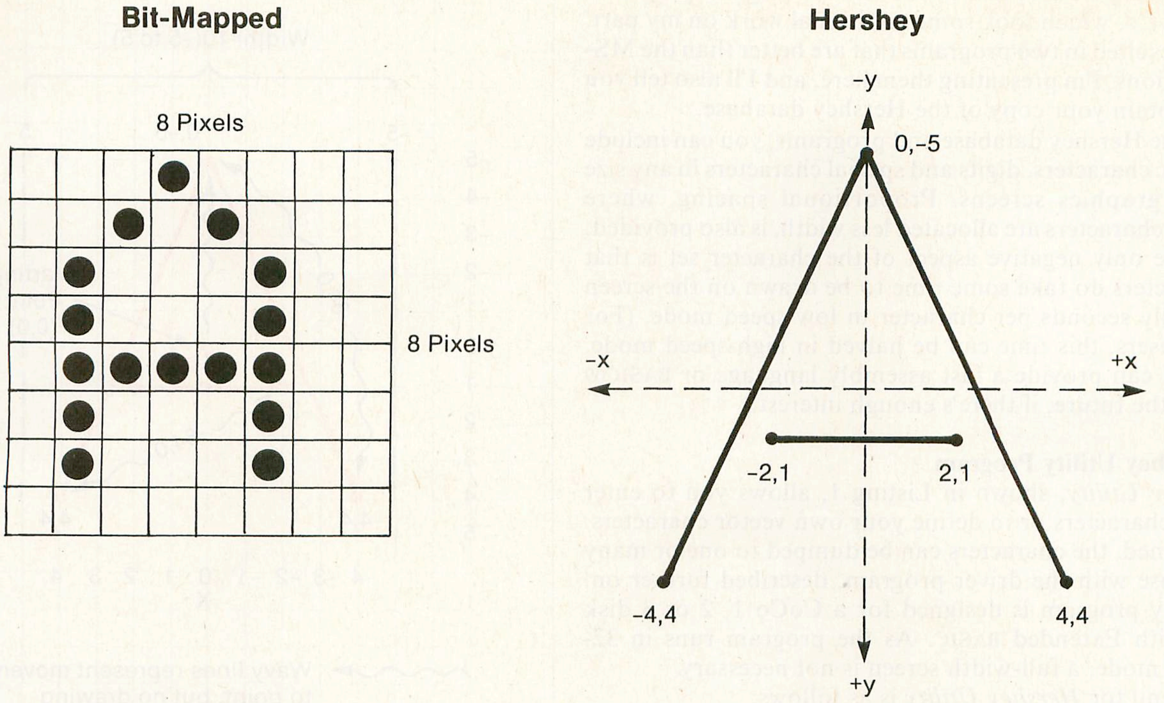

Bit-Mapped
8 Pixels
8 Pixels
Hershey
-y
0,-5
-x
+x
-2,1
2,1
-4,4
4,4
+y

Figure 3: Bit Mapped vs. Hershey Characters

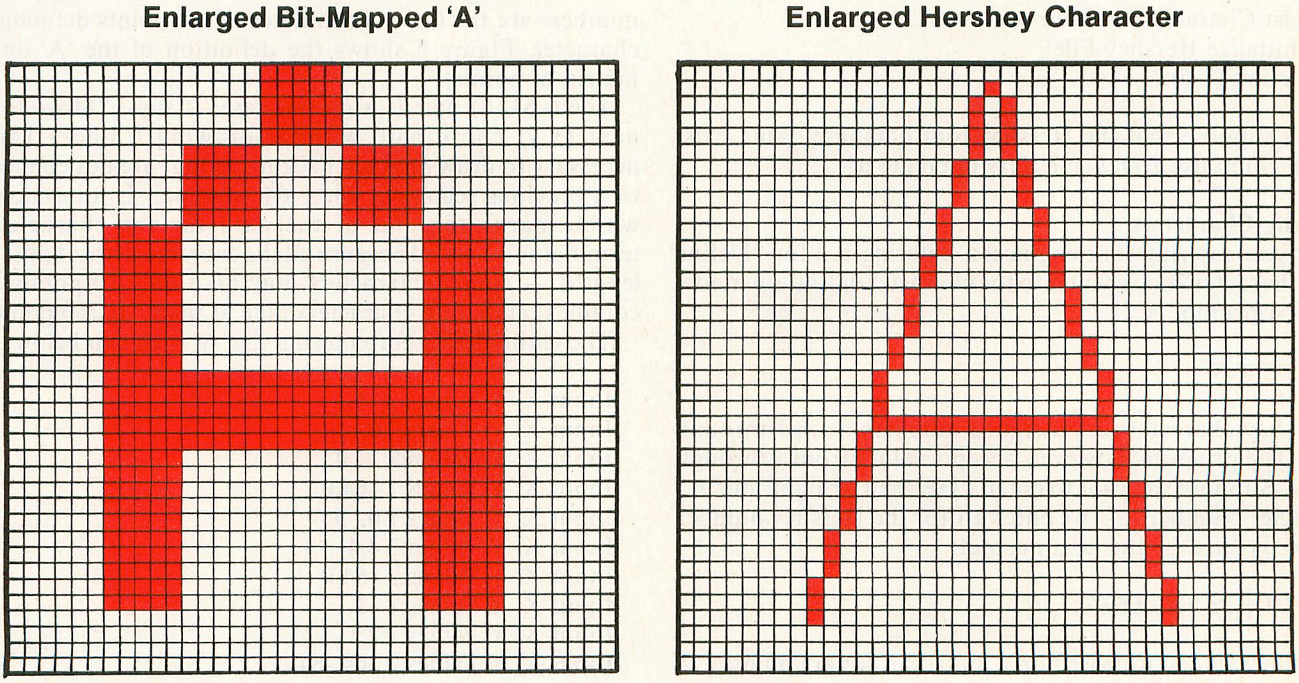

Enlarged Bit-Mapped 'A'
Enlarged Hershey Character

Figure 4: Enlarged Bit-Mapped vs. Hershey Characters

me create a database of characters from the printed character definitions I had. It was no easy task — there were approximately 100,000 bytes worth of data to be entered, all precisely so. The response was overwhelming. I had 58 volunteers the first month, offering from several hours to unlimited amounts of time.

Because of the number of volunteers, I was able to allocate a few hours' worth of work to several dozen readers. The result was a database of more than 100,000 bytes defining all 1,377 Hershey characters. The database can be used on MS-DOS systems, on the CoCo 1, 2 and 3, and on any system with a vector `DRAW` capability.

Thanks to the PCM readers, this database exists now in CoCo-friendly form. I had to modify the original programs for the CoCo, which took some additional work on my part. But this resulted in two programs that are better than the MS-DOS versions. I'm presenting them here, and I'll also tell you how to obtain your copy of the Hershey database.

With the Hershey database and programs, you can include alphabetic characters, digits and special characters in any size on your graphics screens. Proportional spacing, where narrower characters are allocated less width, is also provided. About the only negative aspect of the character set is that the characters do take some time to be drawn on the screen — typically seconds per character in low-speed mode. (For CoCo 3 users, this time can be halved in high-speed mode. Perhaps I can provide a fast assembly language or BASIC09 driver in the future, if there's enough interest.)

**The Hershey Utility Program**

*Hershey Utility*, shown in Listing 1, allows you to enter Hershey characters or to define your own vector characters. Once defined, the characters can be dumped to one or many files for use with the driver program, described further on. The utility program is designed for a CoCo 1, 2 or 3 disk system with Extended BASIC. As the program runs in 32-character mode, a full-width screen is not necessary.

The menu for *Hershey Utility* is as follows:

```
Hershey Font Utility
1. Read Characters from Disk
2. Display Character
3. Define New Character
4. Store Characters on Disk
5. List Characters in Memory
6. Initialize Hershey File!
Selection (1-6):?
```

Let's suppose that the Hershey font database didn't exist — you could use *Hershey Utility* to create it!

**Defining Characters**

For you aspiring font engineers, entering a 3 for "Define New Character" takes you into the character definition mode. The first prompt is:

```
INPUT #:?
```

Hershey characters are assigned numbers from 1 through 3,926. The program, however, accepts values from 1 through 32,639. Suppose we want to enter a Hershey straight-line 'A', Character Number 1 — we enter a 1 for the Hershey number and are greeted by the next prompt:

```
INPUT X,Y VALUES:?
```

Hershey values are based on a matrix of square points 128 units wide by 128 units high. Some characters use fewer points than others, however. A Hershey 'A', a small-format, straight-line character, is defined in the Hershey book of values as follows:

1 : -5, 5: 0, -5: -4, 4:-64, 0: 0, -5: 4, 4:-64, 0: -2, 1: 2, 1: -64, -64

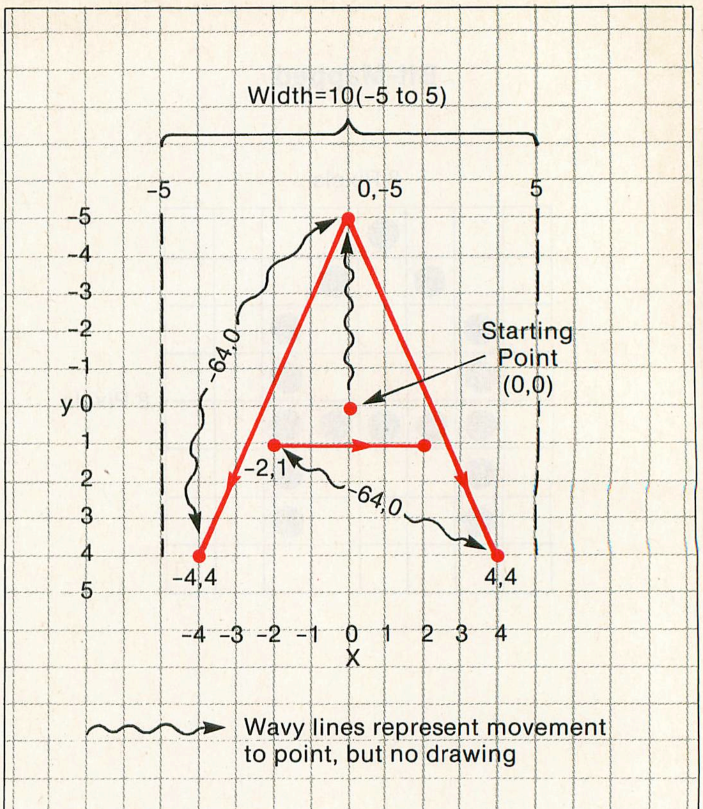


**Figure 5: Defining an 'A' Character**

The first digit is the number of the character. The next two digits are the width of the character in the *x* position. The -5 is five units to the left of the center line, and the 5 is five units to the right of the center line. The remaining pairs of numbers are the $(x,y)$ coordinates of the points defining the character. Figure 5 shows the definition of the 'A' on the matrix of points.

The (-64, 0) pair is a special case. It says, "Move to the next $(x,y)$ coordinate without drawing a line." This is necessary to draw character segments that are not connected to a previous segment. The (-64, -64) pair is a terminator, which marks the end of the data for the character. A terminator is needed because all the characters are of different lengths — simple characters may take only 10 points, but complex, elaborate characters take as many as 250 points!

The entire dialog for entering the 'A' is shown below:

```
Input X, Y Values:? -5,5
Input X, Y Values:? 0,-5
Input X, Y Values:? -4,4
Input X, Y Values:? -64,0
Input X, Y Values:? 0,-5
Input X, Y Values:? 4,4
Input X, Y Values:? -64,0
Input X, Y Values:? -2,1
Input X, Y Values:? 2,1
Input X, Y Values:? -64,-64
```

When the terminating value is entered, the program switches to a 256-by-192 graphics mode screen and draws the character. Pressing any key brings you back to the menu.

This same process is repeated for other characters in the Hershey (or your own) set. If an error is made and the character isn't drawn properly, you can re-enter the character. The program will always take the most recently entered character as the definition of the character. Characters do not have to be entered in any sequential order.

### Listing Characters in Memory

You can list the currently entered characters in memory by selecting Menu Item 5. The program lists all characters in the order they were entered. Here is a typical listing:

```
551 552 553 554 555 556
557 558 559 560 561 562
   1    2    3    3 561
```

Note that there are two repeats (3 and 561) and that the characters are not completely in order.

### Displaying Any Character

You can display any character in memory by selecting Menu Item 2.

When prompted, input the Hershey number, and you'll see the character displayed on a graphics screen. Press any key to get back to the menu.

### Creating a New File

Once you have characters defined, you can create a Hershey file containing the characters. Selecting Menu Item 6 initializes a file, and you'll be met with these prompts:

```
File Name:? SCRIPT/
Y to Continue, N to Restart:
Input Start, End#:? 551, 576
```

The filename above is `SCRIPT/` (the `/` character avoids the extension `/DAT`, which BASIC automatically tacks on if the `/` is not included — forget the `/` if you *want* to create a file with a `/DAT` extension). The character numbers (Start, End) in the file are 551 through 576 inclusive (551 and 576 are included). The numbers from 551 through 576 do not have to exist — this is only a range of character numbers that will be included in the file. Other character numbers will be ignored and not sent to the output file.

You can create one huge file called `HERSHEY/` if you want, but it's probably better to create a variety of smaller files designated by the types of characters in the *file*. The `SCRIPT/` file here includes uppercase script characters, for example. You can create one or many files from the same set of characters in memory.

As the file is created, all characters in memory are sorted by Hershey number and then output to the file. Duplicate characters are deleted, with the program sending the most recent character definition to the file. If you do a "list" after creating the file, you'll see an ordered listing of the numbers with duplicates deleted — for example:

```
  1   2   3 551 552 553
554 555 556 557 558 559
560 561 562
```

### Reading Additional Characters From Disk

Once one or more files have been created, you can reload the file at any time. After creating `SCRIPT/`, for example, you could reload the characters at another session by selecting Menu Item 1. The "read characters" function reads in all or a portion of characters from a named disk file. The read *merges* the data from the disk file with any characters already in memory. Suppose you had defined the characters 651, 652,

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653 and 654. Reading in `SCRIPT/` might result in this dialogue:

```
File Name:? SCRIPT/
Input Start, End#:?1,10000
```

The resulting list of characters after reading in `SCRIPT/` would then be as follows:

```
651 652 653 654 551
552 553 554 555 . . .
```

The range of 1 to 10,000, by the way, was just a convenient way of saying "give me all the characters in the file," assuming that no character number is greater than 10,000.

**Merging Characters in Memory With Existing Data on Disk**

Menu Option 4 lets you merge the current characters in memory with characters in an existing file. It operates much like Menu Item 6, Initialize File, except that the specified range of characters in memory is merged in sequence in the characters of an existing file. If the character already exists in the disk file and it also is present in memory, it replaces the character in the disk file. This menu option can be used to modify a character on disk or simply to merge in new characters.

**If You Never Want to Define Characters**

Maybe you don't want to define any characters. In that case, simply use the existing Hershey characters, which you can get from me. *Hershey Utility*, though, still comes in handy for breaking up the huge Hershey database into smaller files, which can then be loaded in by the program *Hershey Font Driver*, described below. Bear in mind, however, that with a little bit of plotting, you can define your own characters and conveniently save them in a file.

**Bells and Whistles**

*Hershey Utility* was designed primarily for entering Hershey character definitions. There are some embellishments that could make it a more usable program. Some Hershey volunteers complained that the program had no editing capability — if you enter an invalid 240th data pair, you're going to have to repeat the entire entry. That *is* a drawback, but perhaps it can be corrected.

Another problem is that the entire Hershey database cannot be loaded into memory. As a matter of fact, not very many characters can be loaded into the CoCo before it runs out of memory; this is more of a handicap imposed by Extended BASIC. An average Hershey character is 70 bytes long — 100 characters require 7,000 bytes of memory, a large chunk in a system with only about 23K of free memory to start with. However, working with smaller file sizes overcomes this handicap. With the merge capability (Store Characters), the disk file can be up to the limits of the disk — characters can be merged into a master file in small increments. Accessing the Hershey database is no problem, as you'll see in the next description.

**The Hershey Font Driver**

*Hershey Font Driver* is an Extended BASIC program that will work with a CoCo 1, 2 or 3. Once a database of characters is established, *Hershey Font Driver* can access them and display them on the screen. Assuming that you have created a dozen files or so with the *Hershey Utility* program, any of the 1,377 characters can be accessed within seconds and loaded into memory, at which time the current character set is available for screen display.

Any groups of characters can be mixed together in memory. Hershey characters (or your own characters or symbols) can be equated to ASCII characters for easy reference. For example, printing "ABCDEF" can cause ABCDEF to appear as script, Old English or Greek characters, depending on how you've set up the correspondence between the Hershey and ASCII codes.

Characters can be programmed in different sizes, from pinpoint size to a character that fills the screen. Hershey characters, however, work best when they are larger than standard screen characters — small characters lose resolution.

*Hershey Font Driver*, shown in Listing 2, is set up as a subroutine with line numbering from 10000 on up. The comment lines at the beginning of the program can be deleted to save memory. *Hershey Font Driver* is called from your own BASIC program with string `ZA$` set equal to characters you want displayed and with *Font Driver* subcommands; *Font Driver* subcommands are preceded by `%%` — two percent signs — and ended by a semicolon. There are eight subcommands:

| | |
|---|---|
| `%%I;` | Initializes driver |
| `%%Fname;` | Sets the Hershey font filename to "name" |
| `%%Sn,m;` | Sets scale factor for the characters |
| `%%Mx,y;` | Moves an imaginary graphics cursor to the (*x,y*) position corresponding to the graphics mode in force |
| `%%Wn;` | Sets the character width or proportional spacing |
| `%%Rn,m;` | Reads Hershey characters from file "name" |
| `%%Nh,a,m;` | Equates the next `m` Hershey characters to the next `m` ASCII codes |
| `%%C;` | Toggles the control code flag |

To illustrate a typical sequence of commands, look at the "call" to the *Hershey Font Driver* below:

```
100 CLEAR 4000
110 DIM E(200), C$(100), AX(255)
120 PMODE 4,1
130 SCREEN 1,0
140 PCLS
150 (your graphics routines here)
160 ZA$=
170 GOSUB 10000
180 . . .
```

**Initialization**

Before a call can be made to *Hershey Font Driver*, some action must be taken in the calling program. `CLEAR` allocates additional string space. The amount required depends on the size of your program, the amount of string processing your program does, and the amount of free memory. Some experimentation is called for here.

Three arrays are used by *Font Driver*. Array `E` holds two entries for each Hershey character. If you'll be using 100 characters, for example, use `DIM E(200)`. The `C$` array is the string array that holds each Hershey character definition. Use `C$(100)` to hold up to 100 Hershey characters in memory. The `AX` array equates 256 ASCII codes to a Hershey character number and is fixed by `DIM AX(255)`.

Of course, the screen must be set to the proper graphics mode with a SCREEN and PMODE. (If you're using a CoCo 2 and want to do SCREEN displays, use that setup, but see the note farther on — all HDRAWs must be changed to DRAWs.

You can call *Hershey Font Driver* at any time — before, during or after your own graphics displays. Each call is made with ZA$ set to a string of Hershey subcommands intermixed with characters.

### Subcommands to Call the *Driver*

The first subcommand in the string should be a %%I to initialize the arrays and do general setup within *Font Driver.* %%I can be used at any time, however, to "wipe the slate clean" and provide additional room in memory. Here is an example of the subcommand used in a program line:

```
160 ZA$ = "%%I; . . .
```

The next typical subcommand is a %%F NAME command. This simply sets the current filename to the name you've specified. No read is done at this point. The filename can be changed whenever you like, to read in characters from different font files. You might have Greek letters in a file called GREEK/, for example, and German in a file called GERMAN/. Don't forget to add the slash after the name if the file does not have the extension /DAT. This subcommand must be done before an actual read; otherwise, the default filename of " " (null string) will cause an error. It would be used in a program as follows:

```
160 ZA$ = "%%I;%%FSCRIPT/; . . .
```

The next subcommand might be a read command. The %%R command reads in characters n through m from the current file. Any range of values can be read in from the current file. Generally, just read in whatever characters you will be using to save space. Characters read in are appended to any previous characters — the more reads that are done, the larger the list of characters will grow. Purge the list by issuing a %%I subcommand at any time.

One important caution: When using more than one read command with a single file (a typical situation), order the read subcommands by character number. If you do this, the reads will be sequential — the file is kept open and the characters will be read in one pass. If the reads are not in sequence by character number, the program will search from the beginning of the file for each read. In our ever-growing sample program line, the %%R subcommand would be used like this:

```
160 ZA$ = "%%I;%%FSCRIPT/;%%R551,576;%%R651,
676; . . .
```

The above subcommand reads in characters 551 through 576 (uppercase script), followed by characters 651 through 676 (lowercase script) from the Hershey database.

The next subcommand, %%Nh,a,m,;, typically is an equate command. The N subcommand equates a set of Hershey numbers to ASCII codes. ASCII codes run from 0 to 31 (control characters), from 32 to 127 (digits, uppercase and lowercase letters, and special characters), and from 128 through 255 (non-standard characters not in the original

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ASCII set). Suppose you want to equate the Hershey uppercase script characters at 551 through 576 to ASCII characters A through Z. The ASCII characters A through Z are codes 65 through 96. This subcommand would do the trick:

```
160 ZA$ = "%%I;FSCRIPT/;%%R551,576;%%N551,
65,26; . . .
```

The `N` subcommand can be used at any time to change the equivalences for ASCII codes. The advantage of equating other fonts to ASCII A through Z is that standard characters can be used in (and printed from) `ZA$`. Otherwise, `ZA$` might have to be made up of `CHR$` functions — `CHR$(3) +CHR$(17)+CHR$(5) . . ."`. Note that the `N` subcommand works with a block of *m* characters. Sometimes a single character at a time must be equated, for example:

```
1000 ZA$ = ". . . %%N699,32,1; . . ."
```

The above line equates a Hershey blank 699 to an ASCII space, Code 32. Also note that no characters can be displayed with *Font Driver* unless they are defined by the `N` subcommand. The *Font Driver* does not display normal screen characters (use the `HPRINT` command for this in CoCo 3 Extended BASIC).

The `%%C` subcommand "toggles" the control code flag in *Font Driver.* If the flag is set, a carriage return and line feed (ASCII characters 13 and 10) will cause the proper action on the screen. If the flag is not set, ASCII carriage return and line feed codes will be used in finding an equated Hershey character, just like the other ASCII codes. Alternate `%%C` subcommands turn the flag on and off. Use this command for automatic line spacing, if desired.

The size of the characters displayed is determined by two things, the size of the character on digitization (Hershey worked with three basic sizes) and the scale factor. The `%%Sn,m;` subcommand sets the horizontal (*n*) and vertical (*m*) scale factors. A scale factor of 1 produces characters from nine to 21 pixels high in 256-by-192 mode, depending on the font. Setting *n*=*m* will provide a character that looks like the original digitization in 256-by-192 mode. (In `HSCREEN` mode, *n* must be 2.4 times greater than *m* for a 1:1 character.) Increasing *n* produces a taller character. Increasing *m* produces a more squat character. Fractions can be used here. Use the `$$S` subcommand as follows:

```
160 ZA$ = "%%I;%%FSCRIPT/;%%R551,576;%%N551,
65,26;%%S2.4,2; . . .
```

This string sets the *x* scale factor to 2.4 and the *y* scale factor to 2.

The `%%Wn;` subcommand has two width modes for *Font Driver.* If `%%W999;` is specified, *Font Driver* will use the width of the character from the width bytes. This produces proportional spacing, where each character is allocated a different width. Using another width value spaces over a fixed amount of width for every character — the value is the width in pixels. Here is an example of the subcommand that sets proportional spacing used within a program line:

```
160 ZA$ = "%%I;%%FSCRIPT/;%%R551,576;%%N551,
65,26;%%S2.4,2;%%W999; . . .
```

The `%%Mx,y;` subcommand positions an invisible cursor to an *x,y* position. This subcommand is used to find the starting position prior to displaying a new group of characters. The cursor is referenced to the center point of each character, so enough space must be provided on both its left and right sides. A BASIC error may result if the `DRAW` command draws off the screen. The `M` subcommand can be used at any time, and may appear like this:

```
160 ZA$ = "%%I;%%FSCRIPT/;%%R551,576;%%N551,
65,26;%%S2.4,2;%%W999;%%M32,16; . . .
```

The above string moves the cursor to x=32, y=16.

### "Normal" Characters

Screen printing is done by either `CHR$` codes or normal ASCII characters that have been equated to corresponding Hershey numbers. To print in uppercase script, for example, the string could be:

```
160 ZA$ = "%%I;%%FSCRIPT/;%%R551,576;%%R699,
699;%%N551,65,26;%%N699,32,1;%%S2.4,2;%%W9
99;%%M32,16;"THIS IS UC SCRIPT WITH BLANKS"
```

The sequence above will be printed starting at (32,32), the center point of T, with proportional spacing and in script.

Once all the definitions have been made, display of characters becomes much easier. Just use normal text and change the scaling, spacing or position when necessary. Don't hesitate to include your own strings as "macro" subcommands, either. If uppercase script will always be scaled at 2.4 and 2 with proportional spacing and contained in a file called `SCRIPT/`, you can do something like this:

```
100 UC$ = "%%FSCRIPT/;%%R551,576;%%N551,
65,26;%%S2.4,2;%%W999"
600 ZA$ = UC$: GOSUB 10000
```

As a further example of the use of subcommands, see the code in Listing 3 that prints the characters in Figure 1.

### HSCREEN Hershey Font Driver Program

The *Hershey Font Driver* program for CoCo 2 users is identical to the program in Listing 2 except that all `HDRAW`s must be changed to `DRAW`s, and the `SCREEN` must be set by the calling program.

### How to Get the Hershey Font

Because the Hershey font is in the public domain, and because the efforts of our MS-DOS comrades created the large database, the Hershey font database is available free to certifiable CoCo freaks. To get your copy, send a statement by your spouse or significant other indicating that you spend more time with the CoCo than with them. Also send me a formatted 35-track, single-sided disk and include a self-addressed envelope large enough to hold the disk. *Stamp* the envelope with at least $1.07 worth of stamps (or more, if you include heavy disk protection such as cardboard or steel).

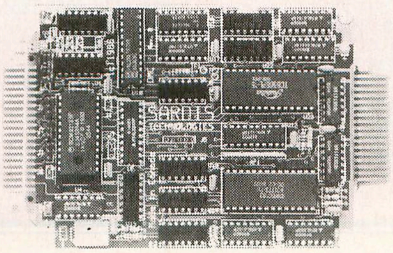
In keeping with the spirit of this project, you may not resell the programs, but may distribute them free as often as you wish, *providing my copyright is maintained.* I'll also try to get the database and programs on Delphi. Write to William Barden, Jr., Post Office Box 3568, Mission Viejo, CA 92692.

The Hershey Font Project has been an exciting one for me because of the enthusiastic response from readers. This started off as a CoCo project, and I'm glad to see that it finally wound up as one. I'm certain that if it had been CoCo readers solicited for the volunteer work, the response would have been just as great. This project shows what can be accomplished by a group of unselfish computer users. Perhaps the next project of this type could be a CoCo project. Any volunteers? ☐

| | | | |
|---|---|---|---|
| 300 | 122 | 1420 | 21 |
| 490 | 146 | 1610 | 220 |
| 700 | 112 | 1790 | 24 |
| 890 | 142 | 1950 | 48 |
| 1100 | 217 | 2120 | 86 |
| 1230 | 153 | END | 171 |

**Listing 1:** FONTUTIL

```
100 '===========================
================================
=========
110 '
120 ' HERSHEY FONT UTILITY. ALLO
WS HERSHEY CHARACTERS TO BE READ
 FROM
130 ' DISK FILE, DISPLAYED, DEFI
NED, AND MERGED WITH DISK FILE D
ATA.
140 '
150 ' V1.0 12-31-87 COCO 1, 2, 3
 VERSION
160 '
170 '--------------------
180 ' INITIALIZE C$ AND E TABLE
POINTERS AND ALLOCATE ARRAYS
190 CLS
200 CLEAR 5000
210 I = 0: J = 0
220 DIM HV( 300 ), C$( 300 ), E(
 600 )
230 PRINT MEM
240 SCREEN 0,1
250 '
260 '--------------------
270 ' DISPLAY MENU
280 CLS
290 PRINT "HERSHEY FONT UTILITY"
300 PRINT "1. READ CHARACTERS FR
OM DISK"
310 PRINT "2. DISPLAY CHARACTER"
320 PRINT "3. DEFINE NEW CHARACT
ER"
330 PRINT "4. STORE CHARACTERS O
N DISK"
340 PRINT "5. LIST CHARACTERS IN
 MEMORY"
350 PRINT "6. INITIALIZE HERSHEY
 FILE!"
360 '
370 '--------------------
380 ' MAIN LOOP. INPUT SELECTION
 AND BRANCH OUT.
390 PRINT "SELECTION (1-6):";
400 INPUT RE
410 IF RE = 5 THEN GOTO 2190
420 IF RE < 1 OR RE > 6 THEN GOT
O 390
430 ON RE GOSUB 460, 710, 1190,
1660, 2190, 1680
440 GOTO 280
450 '
460 '===========================
================================
=========
470 '
480 ' READ CHARACTERS FROM DISK
490 ' MERGES C$ AND E ARRAYS WIT
H HERSHEY CHARACTERS FROM DISK F
ILE.
500 '
510 '--------------------
520 ' INPUT FILENAME, START, AND
 END RANGE OF HERSHEY CHARACTERS
 AND OPEN
530 INPUT "FILE NAME:"; F$
540 INPUT "INPUT START#, END#:";
 SN, EN
550 OPEN "I", #1, F$
```



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| 5 | 13 | 21 | 29 | 37 | 45 | 53 | 61 | |
| 6 | 14 | 22 | 30 | 38 | 46 | 54 | 62 | |
| 7 | 15 | 23 | 31 | 39 | 47 | 55 | 63 | |
| 8 | 16 | 24 | 32 | 40 | 48 | 56 | 64 | |

**PLEASE CIRCLE**
**TAPE or DISK**

```
560 '
570 '--------------------
580 ' READ AND STORE CHARACTER L
INES IF WITHIN INPUT RANGE
590 IF EOF( 1 ) GOTO 680
600 INPUT#1, C$( I )
610 NO = ( ASC( LEFT$( C$( I ),
1 ) ) - 128 ) * 128 +
                      ASC( MID$( C
$( I ), 2, 1 ) ) - 128
620 IF NOT( ( NO >= SN AND NO <=
 EN ) ) THEN 670
630 E( J ) = NO
640 E( J + 1 ) = I
650 J = J + 2
660 I = I + 1
670 IF NO < EN THEN GOTO 590
680 CLOSE
690 RETURN
700 '
710 '==========================
================================
=========
720 '
730 ' DISPLAY CHARACTER FROM MEM
ORY
740 ' DISPLAYS A GIVEN HERSHEY C
HARACTER # IN MEMORY. THE LAST C
HARACTER
750 ' FOUND IS DISPLAYED IF THER
E ARE DUPLICATES. CALLED BY DEFI
NE CHARACTER.
760 '
770 '--------------------
780 ' INPUT VALID #. IF NOT FOUN
D, ANOTHER PROMPT GIVEN. ENTERIN
G 0 TERMINATES.
790 INPUT "INPUT HERSHEY #:"; NO
800 IF NO = 0 THEN GOTO 1170
810 FOR K = J - 2 TO 0 STEP -2
820 IF E( K ) = NO THEN 880
830 NEXT K
840 GOTO 790
850 '
860 '--------------------
870 ' INITIALIZATION AND MOVE TO
 SCREEN CENTER.
880 SCREEN 1,0: PMODE 4,1: PCLS
890 K = E( K + 1 )
900 SX = 1.5: SY = 1.5
910 DRAW "BM128, 96"
920 X = 128: Y =96
930 L = 5
940 '
950 '--------------------
960 ' START AT FIRST X/Y COORDIN
ATE, BYPASS WIDTH
970 IF LEN( C$( K ) ) <= 6 THEN
GOTO 1170
980 A = ASC( MID$( C$( K ), L, 1
 ) ) - 128
```

```
990 B = ASC( MID$( C$( K ), L +
1, 1 ) ) - 128
1000 L = L + 2
1010 A = A * CSX: B = B * SY: A
= INT( X + A ): B = INT( Y + B )
1020 DRAW "BM" + STR$( A ) + ","
 + STR$( B )
1030 '
1040 '--------------------
1050 ' GET REMAINING X/Y COORDIN
ATES AND DRAW LINE SEGMENTS
1060 A = ASC( MID$( C$( K ), L,
1 ) ) - 128
1070 B = ASC( MID$( C$( K ), L +
 1, 1 ) ) - 128
1080 L = L + 2
1090 IF ( A = -64 ) AND ( B = -6
4 ) THEN GOTO 1170
1100 IF NOT( ( A = -64 AND B = 0
 ) ) THEN GOTO 1150
1110 A = ASC( MID$( C$( K ), L,
1 ) ) - 128
1120 B = ASC( MID$( C$( K ), L +
 1, 1 ) ) - 128
1130 L = L + 2
1140 A = A * SX: B = B * SY: A =
 INT( X + A ): B = INT( Y + B):
DRAW "BM" +           STR$( A ) +
 "," + STR$( B ) : GOTO 1160
1150 A = A * SX: B = B * SY: A =
 INT( X + A ): B = INT( Y + B ):
 DRAW "M" +           STR$( A ) +
 "," + STR$( B )
1160 GOTO 1060
1170 A$ = INKEY$: IF A$="" THEN
GOTO 1170 ELSE RETURN
1180 '
1190 '==========================
================================
==========
1200 '
1210 ' DEFINE NEW CHARACTER.
1220 ' MAKES C$ ENTRY IN MEMORY,
 STORING HERSHEY CHARACTER AS A
STRING. FIRST
1230 ' TWO CHARACTERS OF STRING
ARE NUMBER, MS/LS; NEXT TWO CHAR
ACTERS
1240 ' ARE STANDARD HERSHEY WIDT
H FROM HERSHEY DEFINITIONS; REMA
INING
1250 ' CHARACTERS ARE X/Y PAIRS
FROM HERSHEY DEFINITIONS. TERMIN
ATOR IS
1260 ' -64,-64. WIDTH AND X/Y PA
IRS ARE STORED IN EXCESS 128 COD
E.
1270 '
1280 '--------------------
1290 ' Input Hershey # and initi
alization
```

```
1300 INPUT "INPUT #:"; NO
1310 A$ = ""
1320 K = 0
1330 '
1340 '--------------------
1350 ' Input width, X/Y pairs, a
nd -64/-64 terminator
1360 INPUT "INPUT X,Y VALUES:";
HV( K ), HV( K + 1 )
1370 X = HV( K ): Y = HV( K + 1
)
1380 K = K + 2
1390 IF NOT( X = -64 AND Y = -64
 ) THEN GOTO 1360
1400 '
1410 '--------------------
1420 ' CONSTRUCT STRING AND MAKE
 C$ ENTRY
1430 C$( I ) = CHR$( INT( NO / 1
28 ) + 128 ) + CHR$( NO - ( INT(
 NO / 128 ) ) *      128 + 128 )
1440 FOR L = 0 TO K - 1
1450 C$( I ) = C$( I ) + CHR$( H
V( L ) + 128 )
1460 NEXT L
1470 '
1480 '--------------------
1490 ' MAKE E TABLE ENTRY, BUMP
POINTERS, AND GO TO DISPLAY CHAR
ACTER
1500 E( J ) = NO
1510 E( J + 1 ) = I
1520 J = J + 2
1530 I = I + 1
1540 K = J - 2
1550 GOTO 880
1560 '
1570 '==========================
================================
==========
1580 '
1590 ' STORE CHARACTERS ON DISK
1600 ' SORTS C$ ENTRIES BY HERSH
EY #, ELIMINATING DUPLICATE ENTR
IES IN
1610 ' MEMORY BY KILLING ALL BUT
 THE LAST. MERGES MEMORY C$ ENTR
IES OVER
1620 ' GIVEN RANGE WITH NAMED FI
LE, CREATING NEW NAMED FILE. REP
LACES
1630 ' EXISTING FILE ENTRIES WIT
H NEW DEFINITION FROM MEMORY.
1640 '
1650 '--------------------
1660 INPUT "FILE NAME:"; F$
1670 NF = 0: OPEN "I", #1, F$: G
OTO 1730
```

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TEXTFORM is compatible with all Color Computers with a minimum of 64K, disk drive, and printer. This machine language program will format ASCII text files into two column pages quickly and easily. This is not another word processor. TEXTFORM is a user defineable two column text formatter program which will allow your Color Computer to create very professional documents without hours of tedious work. TEXTFORM is a versitile enhancement to any word processing system whether you are a casual or professional user.

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```
1680 INPUT "FILE NAME:"; F$: NF
= 1
1690 PRINT "THIS DESTROYS "; F$;
 " FILE!"
1700 PRINT "Y TO CONTINUE, N TO
RESTART:"
1710 A$ = INKEY$: IF A$ = "" THE
N GOTO 1710
1720 IF A$ = "Y" THEN GOTO 1730
ELSE GOTO 280
1730 OPEN "O", #2, "HERSHEYN/"
1740 INPUT "INPUT START, END#:";
 SN, EN
1750 '
1760 '--------------------
1770 ' BUBBLE SORT E TABLE AND D
ELETE FIRST DUPLICATE ENTRIES
1780 PRINT "SORTING..."
1790 IF J = 2 THEN GOTO 1930
1800 SWAPF = 0
1810 FOR L = 0 TO J - 4 STEP 2
1820 IF E( L + 2 ) < E( L ) THEN
 T1 = E( L + 2 ): T2 = E( L + 3
): E( L + 2 ) =      E( L ): E(
L + 3 ) = E( L + 1 ): E( L ) = T
1: E( L + 1 ) = T2: SWAPF = 1
1830 IF ( E( L + 2 ) = E( L ) )
AND ( E( L ) <> 65535 ) THEN E(
L )=65535: T1 =      E( L + 2 ):
 T2 = E ( L + 3 ): E( L + 2 ) =
E( L ): E( L + 3 ) = E( L + 1 ):
     E( L ) = T1: E( L + 1 ) = T
2: SWAPF = 1
1840 NEXT L
1850 IF SWAPF = 1 THEN 1800
1860 FOR K = 0 TO J - 2 STEP 2
1870 IF E( K ) = 65535 THEN J =
K: GOTO 1890
1880 NEXT K
1900 '--------------------
1910 ' MERGE C$ ENTRIES IN MEMOR
Y WITH NAMED FILE, REPLACING FIL
E
1920 ' ENTRIES IF SAME HERSHEY #
 IN MEMORY.
1930 K = 0
1940 IF NF = 1 THEN GOTO 2050
1950 IF EOF( 1 ) THEN GOTO 2050
ELSE IF K = J THEN GOTO 2090 ELS
E         C            INPUT#1, A
$
1960 NO = ( ASC( LEFT$( A$, 1 )
) - 128 ) * 128 + ASC( MID$( A$,
 2, 1 ) ) - 128
1970 IF K = J THEN PRINT#2, A$:
GOTO 2090
1980 IF E( K ) >= NO THEN GOTO 2
000
1990 IF E( K )< SN THEN K = K +
2: GOTO 1980 ELSE IF E ( K ) > E
N THEN PRINT#2,      A$: GOTO 20
90 ELSE PRINT#2, C$( E( K + 1 )
): K = K + 2: GOTO 1970
2000 IF E( K ) <> NO THEN GOTO 2
030
2010 IF E( K ) < SN THEN PRINT#2
, A$: K = K + 2: GOTO 1950 ELSE
IF E( K ) > EN      THEN PRINT#
2, A$: GOTO 2090 ELSE PRINT#2, C
$( E( K + 1 ) ): K = K + 2:
     GOTO 1950
2020 ' E( K ) > NO
2030 IF E( K ) < SN THEN PRINT#2
, A$: GOTO 1950 ELSE IF E( K ) >
 EN THEN              PRINT#2, A$
: GOTO 2090 ELSE PRINT#2, A$: GO
TO 1950
2040 '--------------------
2050 IF ( K = J ) OR ( E( K ) >
EN ) THEN GOTO 2140
2060 IF E( K ) >= SN THEN PRINT#
2, C$( E( K + 1 ) ): K = K + 2:
GOTO 2050
2070 K = K + 2: GOTO 2050
2080 '--------------------
2090 IF EOF( 1 ) THEN GOTO 2140
2100 INPUT#1, A$: PRINT#2, A$: G
OTO 2090
2110 '
2120 '--------------------
2130 ' FINAL LEANUP. DELETE OLD
MASTER, RENAME NEW MASTER TO "HE
RSHEY".
2140 CLOSE
2150 IF NF <> 1 THEN KILL F$
2160 RENAME "HERSHEYN/" TO F$
2170 RETURN
2180 '
2190 '==========================
================================
===========
2200 '
2210 ' LIST CHARACTERS IN MEMORY
2220 ' LIST CURRENT HERSHEY CHAR
ACTERS IN MEMORY, INCLUDING DUPL
ICATES.
2230 '--------------------
2240 '
2250 CLS
2260 FOR K = 0 TO J - 2 STEP 2
2270 IF POS( 0 ) > 20 THEN PRINT
 E( K ) ELSE PRINT E( K );
2280 NEXT K
2290 PRINT: PRINT "PRESS ANY KEY
 TO CONTINUE"
2300 A$ = INKEY$: IF A$ = "" THE
N GOTO 2300
2310 CLS
2320 GOTO 270
2330 '
2340 '==========================
================================
===========
```

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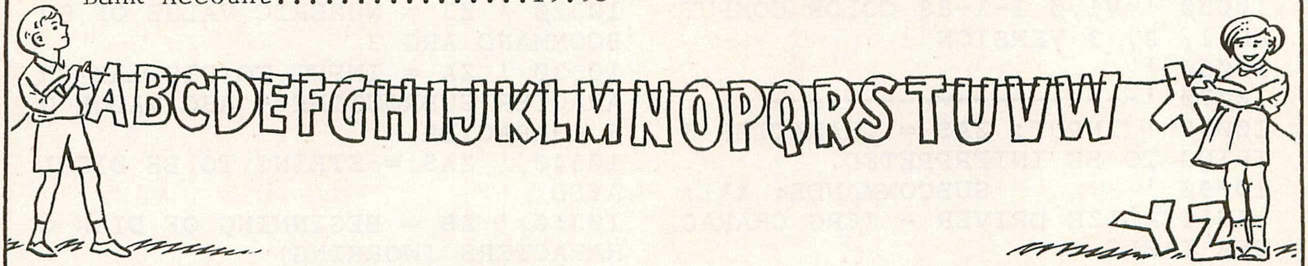

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| 10140 | 29 | 11190 | 90 |
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| 10580 | 31 | 11740 | 215 |
| 10810 | 119 | 12000 | 108 |
| 10980 | 166 | END | 226 |

**Listing 2:** HFDRIVER

```
10000 '=========================
================================
===============
10010 '
10020 ' HERSHEY FONT DISPLAY. LO
ADS HERSHEY CHARACTERS FROM A DI
SK FILE.
10030 ' DISPLAYS CHARACTERS AT G
IVEN LOCATION. SIZE OF CHARACTER
 MAY BE
10040 ' MODIFIED AS REQUIRED.
10050 ' V1.0 1-1-88 COLOR COMPUT
ER 1, 2, 3 VERSION
10060 '
10070 '-------------------
10080 ' INPUT: ZA$ = CHARACTER S
TRING TO BE INTERPRETED.
10090 '        SUBCOMMANDS: %%I;
 INITIALIZE DRIVER - ZERO CHARAC
TER TABLE
10100 '                     %%FN
AME; SET DISK FILE NAME
10110 '                     %%SN
,M; SET SCALE FACTORS TO N HOR,
M VERTICAL
10120 '                     %%MX
,Y; POSITION TO GRAPHICS COORDIN
ATE X,Y
10130 '                     %%WN
; SET WIDTH TO N PIXELS OR 999 F
OR PROPORTIONAL
10140 '                     %%RN
,M; READ HERSHEY CHARACTERS FROM
 DISK FILE IN
10150 '                        R
ANGE N TO M
10160 '                     %%NH
,A,M; EQUATE NEXT M HERSHEY CHAR
ACTERS TO
10170 '                        N
EXT M ASCII CHARACTERS
10180 '                     %%C;
 TOGGLE CONTROL CODE FLAG
10190 '                     (STR
ING) DISPLAY ALL OTHER CHARACTER
S IN HERSHEY
10200 '                        F
ORMAT
10210 ' OUTPUT: PARAMETERS CHANG
ED OR CHARACTERS DISPLAYED ON SC
REEN UNLESS
10220 '          ERROR, IN WHICH
CASE ZE = CHARACTER POSITION OF
LAST ERROR
10230 '
10240 '-------------------
10250 ' DATA DICTIONARY
10260 ' AX() = ASCII ARRAY; -1 I
F NO CHARACTER DEFINED ELSE POIN
TS TO E()
10270 ' C$() = ARRAY OF HERSHEY
CHARACTERS; UP TO 255 CHARACTERS
/ENTRY
10280 ' E() = ARRAY OF HERSHEY #
 POINTERS; HERSHEY # AND INDEX T
O C$
10290 ' Z1 = NUMERIC VALUE OF SU
BCOMMAND ARG 1
10300 ' Z1$ = STRING VALUE OF SU
BCOMMAND ARG 1
10310 ' Z2 = NUMERIC VALUE OF SU
BCOMMAND ARG 2
10320 ' Z3 = NUMERIC VALUE OF SU
BCOMMAND ARG 3
10330 ' ZA = INPUT TO DISPLAY CH
ARACTER SUBROUTINE - ASC VALUE O
F CHARACTER
10340 ' ZA$ = STRING TO BE DISPL
AYED
10350 ' ZB = BEGINNING OF DISK C
HARACTERS (WORKING)
10360 ' ZB$ = CURRENT CHARACTER
(WORKING)
10370 ' ZC = ENDING OF DISK CHAR
ACTERS (WORKING)
10380 ' ZC$ = WORKING
10390 ' ZE = ERROR FLAG FOR RETU
RN; 0 IF NO ERROR OR CP IF ERROR
10400 ' ZF = WORKING
10410 ' ZF$ = DISK FILE NAME, DE
FAULT = ""
10420 ' ZG = WORKING
10430 ' ZI = POINTS TO NEXT (UNU
SED) ENTRY IN C$
10440 ' ZJ = POINTS TO NEXT (UNU
SED) ENTRY IN E
10450 ' ZK = WORKING
10460 ' ZL = WORKING
10470 ' ZM = INDEX TO CURRENT CH
ARACTER IN INPUT STRING
10480 ' ZN = # OF ARGUMENTS FROM
 PARSE SUBROUTINE
10490 ' ZO = HERSHEY # (WORKING)
10500 ' ZQ = WORKING
10510 ' ZS = FUNCTION # FROM PAR
SE SUBROUTINE
10520 ' ZU = CURRENT HORIZONTAL
SCALE FACTOR
10530 ' ZV = CURRENT VERTICAL SC
ALE FACTOR
10540 ' ZW = CURRENT WIDTH IN PI
XELS OR 999 FOR PROPORTIONAL
```

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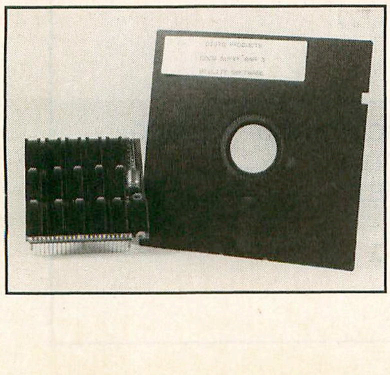

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```
10550 ' ZX = CURRENT X POSITION
10560 ' ZY = CURRENT Y POSITION
10570 ' ZZ = TOGGLE FOR CONTROL
CHARACTER ACTION
10580 ' **WORKING** INDICATES A
VARIABLE USED FOR TEMPORARY STOR
AGE
10590 '
10600 '--------------------
10610 ' START OF CODE
10620 ZM = 1: ZE = 0
10630 IF ZM > LEN( ZA$ ) THEN RE
TURN
10640 ZB$ = MID$( ZA$, ZM, 1 )
10650 IF ZB$ <> "%" THEN GOTO 11
400 ELSE IF MID$( ZA$, ZM + 1, 1
) <> "%"                 THEN GOTO
 11400
10660 '
10670 ' "%%" SUBCOMMAND HERE
10680 '--------------------
10690 GOSUB 11530
10700 ON ZS GOSUB 10750,10820,10
860,10910,10960,11010,11190,1134
0
10710 GOTO 10630
10720 '
10730 '--------------------
10740 ' "%%I;" SUBCOMMAND - INIT
IALIZE
10750 IF ZN <> 0 THEN ZE = ZM: G
OTO 10780 ELSE ZI = 0: ZJ = 0: Z
F$ = "": ZO = 0
10760 FOR ZL = 0 TO 255: AX( ZL
) = - 1: NEXT
10770 ZU = 1: ZV = .5: ZW = 10:
ZE = 0: ZZ = 0
10780 RETURN
10790 '
10800 '--------------------
10810 ' "%%F,NAME;" SUBCOMMAND -
 SET FILE NAME
10820 IF ZN <> 1 THEN ZE = ZM: G
OTO 10830 ELSE ZF$ = Z1$: CLOSE
2
10830 RETURN
10840 '--------------------
10850 ' "%%SN,M;" SUBCOMMAND - S
ET SCALE FACTORS
10860 IF ZN <> 2 THEN ZE = ZM: G
OTO 10870 ELSE ZU = Z1: ZV = Z2
10870 RETURN
10880 '
10890 '--------------------
10900 ' "%%MX,Y;" SUBCOMMAND - S
ET GRAPHICS POSITION
10910 IF ZN <> 2 THEN ZE = ZM: G
OTO 10920 ELSE ZX = Z1: ZY = Z2
10920 RETURN
10930 '
```

```
10940 '--------------------
10950 ' "%%WN;" SUBCOMMAND - SET
 WIDTH TO N PIXELS
10960 IF ZN <> 1 THEN ZE = ZM: G
OTO 10970 ELSE ZW = Z1
10970 RETURN
10980 '
10990 '--------------------
11000 ' "%RN,M;" SUBCOMMAND - RE
AD CHARACTERS FROM DISK
11010 IF ZN <> 2 THEN ZE = ZM: G
OTO 11140 ELSE ZB = Z1: ZC = Z2
11020 IF ZO <> 0 THEN IF ZO < ZB
 THEN GOTO 11040 ELSE CLOSE 2
11030 OPEN "I", #2, ZF$
11040 IF EOF( 2 ) GOTO 11130
11050 INPUT#2, C$( ZI )
11060 ZO = ( ASC( LEFT$( C$( ZI
), 1 ) ) - 128 ) * 128 +
                 ASC( MID$(
 C$( ZI ), 2, 1 ) ) - 128
11070 IF NOT( ( ZO >= ZB AND ZO
<= ZC ) ) THEN GOTO 11120
11080 E( ZJ ) = ZO
11090 E( ZJ + 1 ) = ZI
11100 ZJ = ZJ + 2
11110 ZI = ZI + 1
11120 IF ZO < ZC THEN GOTO 11040
 ELSE GOTO 11140
11130 CLOSE 2
11140 RETURN
11150 '
11160 '--------------------
11170 ' "%%NH,A,M;" SUBCOMMAND -
 EQUATE HERSHEY TO ASCII
11180 ' EQUATES AS ENTRIES TO E
ENTRIES
11190 IF ( ZN <> 3 ) THEN ZE = Z
M: GOTO 11300
11200 FOR ZL = 1 TO Z3
11210 FOR ZQ = 0 TO ZJ - 2 STEP
2
11220 IF E( ZQ ) = Z1 THEN GOTO
11260
11230 NEXT
11240 ZE = ZM
11250 GOTO 11270
11260 AX( Z2 ) = ZQ
11270 Z1 = Z1 + 1
11280 Z2 = Z2 + 1
11290 NEXT ZL
11300 RETURN
11310 '
11320 '--------------------
11330 ' "%%C;" SUBCOMMAND - TOGG
LES CONTROL CODE FLAG
11340 IF ZN <> 0 THEN ZE = ZM: G
OTO 11360
11350 ZZ = ZZ XOR 1
11360 RETURN
```

```
11370 '
11380 '--------------------
11390 ' NORMAL CHARACTER - MAY B
E ASCII 0 THROUGH 255
11400 ZA = ASC( ZB$ )
11410 IF ( ZA >= 32 ) THEN GOTO
11440 ELSE IF ZZ <> 0 THEN GOTO
11440
11420 IF ZA = 10 THEN ZY = INT(
ZY + 32 * ZV ): GOTO 11450
11430 IF ZA <> 13 THEN GOTO 1145
0 ELSE ZX = INT( 16 * ZU ): GOTO
 11450
11440 GOSUB 11860
11450 ZM = ZM + 1
11460 GOTO 10630
11470 '
11480 '=========================
================================
===========
11490 '
11500 ' PARSE SUBCOMMAND LINE SU
BROUTINE
11510 ' RETURNS ZN = # ARGS; Z1
= ARG1; Z2 = ARG2; Z3 = ARG3; ZE
 = CP OF           ERROR; Z
S = SUBCOMMAND FUNCTION
11520 '
11530 ZN = 0
11540 ZC$ = MID$( ZA$, ZM + 2, 1
)
11550 ZS = INSTR( "IFSMWRNC", ZC
$ )
11560 IF ZS = 0 THEN ZS = INSTR(
 "ifsmwrnc", ZC$ )
11570 IF ZS = 0 THEN ZE = ZM
11580 ZM = ZM + 3
11590 FOR ZF = ZM TO LEN( ZA$ )
11600 IF MID$( ZA$, ZF, 1 ) = ";
" OR MID$( ZA$, ZF, 1 ) = "," TH
EN GOTO 11630
11610 NEXT ZF
11620 ZE = ZF - 1: ZM = ZE: GOTO
 11790
11630 Z1 = VAL( MID$( ZA$, ZM, Z
F - ZM ))
11640 Z1$ = MID$( ZA$, ZM, ZF -
ZM )
11650 ZM = ZF + 1: IF ZF <> 4 TH
EN ZN = ZN + 1
11660 IF MID$( ZA$, ZF, 1 ) = ";
" THEN GOTO 11790
11670 FOR ZF = ZM TO LEN( ZA$ )
11680 IF MID$( ZA$, ZF, 1 ) = ";
" OR MID$( ZA$, ZF, 1 ) = "," TH
EN GOTO 11710
11690 NEXT ZF
11700 ZE = ZF - 1: ZM = ZE: GOTO
 11790
11710 Z2 = VAL( MID$( ZA$, ZM, Z
F - ZM ) )
11720 ZM = ZF + 1: ZN = ZN + 1:
IF MID$( ZA$, ZF, 1 ) = ";" THEN
 GOTO 11790
11730 FOR ZF = ZM TO LEN( ZA$ )
11740 IF MID$( ZA$, ZF, 1 ) = ";
" THEN GOTO 11770
11750 NEXT ZF
11760 ZE = ZF - 1: ZM = ZE: GOTO
 11790
11770 Z3 = VAL( MID$( ZA$, ZM, Z
F - ZM ) )
11780 ZM = ZF + 1: ZN = ZN + 1
11790 RETURN
11800 '
11810 '=========================
================================
===========
11820 '
11830 ' DISPLAY CHARACTER SUBROU
TINE
11840 ' DISPLAYS A GIVEN HERSHEY
CHARACTER # REFERENCED BY ASCII
CODE
11850 '
11860 IF AX( ZA ) = -1 THEN ZE =
```

*1988 -- The Year of the Hard Disk!*

The CoCo XT hard disk interface from **Burke & Burke** lets you connect up to 2 low cost, PC compatible 5-120 Megabyte capacity hard drives to your CoCo. You buy the drive, Western Digital WD1002-WX1 or WD1002-27X (RLL) controller, and a case from the PC dealer of your choice. Just plug them into the CoCo XT, plug the CoCo XT into your Multi-PAK, and you have a 20 Meg OS9 hard disk system for **under $450!**

**Great for multi-user systems!** The CoCo XT interface uses advanced "NO HALT" hard disk controllers, which do not halt your CoCo and do not disable or use interrupts during hard disk access. You get full type-ahead, and the system clock does not lose time during hard disk access. Fully compatible with most RS-232 expansion ports!

**CoCo XT** (with anodized housing, 50 page user manual, hard disk back-up utility and new, Version 2.0 drivers for use with both OS9 & HYPER-I/O) -- $69.95. Or choose the **CoCo XT-RTC** (includes real-time clock / calendar with battery backup) -- $99.95

**THE PROFESSIONAL TOUCH: XT-ROM** -- Automatically boots OS9 from your hard disk. Installs in the BIOS ROM socket of your hard disk controller -- $19.95.

*Announcing the Dynamic Disk Interface!*

Got the 35-track floppy disk blues? Burke & Burke proudly presents **HYPER-I/O Version 2.0** -- the program that modifies the RS-DOS Disk BASIC in your CoCo 1, 2, or 3 to provide a "Dynamic Disk Interface". This program lets you use your existing BASIC and RS-DOS software with hard disk interfaces (such as the CoCo XT), RAM Disks, and any mix of floppy drives from 160K to 720K each. HYPER-I/O can even read standard disks in those quad-density, 160 track floppy drives. Fully RESET protected, user-configurable, expandable, OS9 compatible, EPROM-able HYPER-I/O may soon be **THE** RS-DOS enhancement of choice for the CoCo 1, CoCo 2, and CoCo 3!

**HYPER-I/O** (64K, includes 50 page user manual , BASIC & OS9 utilities) -- $29.95.
**HYPER-III** (RAM Disk and Print Spooler for CoCo 3 HYPER-I/O) --$19.95

*OS9 Directory Assistants* WILD lets you use wild cards with OS9's commands. MV rapidly moves files, and even entire directories, from place to place on your hard or floppy disks. **WILD & MV** -- one disk, two great utilities, only $19.95!

OS9: wild asm /d0/src/*.src o=/d1/abs/release/*.abs
OS9: mv /d1/abs/release /d1/release

**Burke & Burke**
P.O. Box 1283 Palatine, IL 60078-1283 (312) 397-2898

MasterCard VISA

ILLINOIS RESIDENTS PLEASE ADD 7% SALES TAX. COD's add $2.20. Shipping (within the USA) $2.00 per CoCo XT; $1.50 per disk or ROM. Please allow 2 weeks for delivery (overnight delivery also available for in-stock items). Telephone orders accepted (312) 397-2898.

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For credit card orders call (800) 847-0309, 8 a.m. to 5 p.m. EST

All other inquiries call (502) 228-4492.

```
 ZM: GOTO 12180
11870 ZK = E( AX( ZA ) + 1 )
11880 IF ZW <> 999 THEN GOTO 119
20
11890 ZF = -( ASC( MID$(C$( ZK )
, 3, 1 )) - 128 ) + ASC( MID$(C$
( ZK ), 4, 1 ))          - 128
11900 ZF = ( ZF / 2 ) * ZU
11910 ZX = INT(ZX + ZF)
11920 HDRAW "BM" + STR$( ZX ) +
"," + STR$( ZY )
11930 ZL = 5
11940 ' START AT FIRST X/Y COORD
INATE, BYPASS WIDTH
11950 IF LEN( C$( ZK ) ) <= 6 TH
EN GOTO 12130
11960 ZF = ASC( MID$( C$( ZK ),
ZL, 1 ) ) - 128
11970 ZG = ASC( MID$( C$( ZK ),
ZL + 1, 1 ) ) - 128
11980 ZL = ZL + 2
11990 ZF=ZF*ZU:ZG=ZG*ZV:ZF=INT(Z
X+ZF):ZG=INT(ZY+ZG)
12000 HDRAW "BM" + STR$( ZF ) +
"," + STR$( ZG )
12010 ' GET REMAINING X/Y COORDI
NATES AND DRAW LINE SEGMENTS
12020 ZF = ASC( MID$( C$( ZK ),
ZL, 1 ) ) - 128
12030 ZG = ASC( MID$( C$( ZK ),
ZL + 1, 1 ) ) - 128
12040 ZL = ZL + 2
12050 IF ( ZF = -64 ) AND ( ZG =
 -64 ) THEN GOTO 12130
12060 IF NOT( ( ZF = -64 AND ZG
= 0) ) THEN 12110
12070 ZF = ASC( MID$( C$( ZK ),
ZL, 1 ) ) - 128
12080 ZG = ASC( MID$( C$( ZK ),
ZL + 1, 1 ) ) - 128
12090 ZL = ZL + 2
12100 ZF = ZF * ZU: ZG = ZG * ZV
: ZF = INT(ZX + ZF): ZG = INT(ZY
 + ZG):                HDRAW "BM"
 + STR$( ZF ) + "," + STR$( ZG )
: GOTO 12120
12110 ZF = ZF * ZU: ZG = ZG * ZV
: ZF = INT(ZX + ZF): ZG = INT(ZY
 + ZG):                HDRAW "M"
+ STR$( ZF ) + "," + STR$( ZG )
12120 GOTO 12020
12130 IF ZW <> 999 THEN ZX = ZX
+ ZW: GOTO 12180
12140 ZF = -( ASC( MID$(C$( ZK )
, 3, 1 )) - 128 ) + ASC( MID$(C$
( ZK ), 4, 1 ))          - 128
12150 ZF = ( ZF / 2 ) * ZU
12160 ZX = ZX + ZF
12180 RETURN
12190 '=========================
================================
================
```

**Listing 3:** EXAMPLE

```
50 ' DEMONSTATION 1 FOR HERSHEY
SCREEN - FONTS
52 CLEAR 7000
54 DIM E(300), C$(150), AX(255)
56 HSCREEN 4
58 PCLS
60 ZA$="%%I;%%FHERSHMAS/;%%R501,
526;%%R601,626;%%R699,699;%%N699
,32,1;%%N501,65,26;%%N601,97,26;
":GOSUB 10000
62 ZA$="%%S1.0,0.4;%%W20;%%M32,1
6;This is Simple Text": GOSUB 10
000
64 ZA$="%%W999;%%M32,36;This is
Proportional Text": GOSUB 10000
66 ZA$="%%I;%%FHERSHMAS/;%%R699,
699;%%R3001,3026;%%R3101,3126;%%
N3001,65,26;%%N3101,97,26;%%N699
,32,1;%%S1.0,0.4;%%W999;%%M32,56
;This is Complex Text": GOSUB 10
000
68 ZA$="%%I;%%FHERSHMAS/;%%R699,
699;%%R2051,2076;%%R2151,2176;;%
%N2051,65,26;%%N2151,97,26;%%N69
9,32,1;%%S1.0,0.4;%%W999;%%M32,7
6;This is Italics": GOSUB 10000
70 ZA$="%%S2.0,1.5;%%M32,103;Lar
ge and Tall": GOSUB 10000
72 ZA$="%%I;%%FHERSHMAS/;%%R699,
699;%%R3301,3325;%%N3301,65,26;%
%N699,32,1;%%S1.5,0.6;%%W999;%%M
32,140;DEUTSCHLAND": GOSUB 10000
74 ZA$="%%R3001,3003;%%N3001,65,
3;": GOSUB 10000
76 ZA$="%%S0.3,0.15;%%M32,170;AB
C%%S0.5,0.2;%%M62,170;ABC%%S0.75
,0.3;%%M112,170;ABC%%S1.0,0.4;%%
M177,170;ABC%%S1.5,0.6;%%M270,17
0;ABC%%S2.0,0.8;%%M400,170;ABC%%
S3.0,1.6;%%M560,170;A": GOSUB 10
000
78 GOTO 78
```

# Racksellers

***The retail stores listed below carry THE RAINBOW on a regular basis and may have other products of interest to Tandy Color Computer users. We suggest you patronize those in your area.***

| | |
|---|---|
| **ALABAMA** | |
| Birmingham | Jefferson News Co. |
| Brewton | McDowell Electronics |
| Florence | Anderson News Co. |
| Greenville | M & B Electronics |
| Madison | Madison Books |
| Montgomery | Trade 'N' Books |
| Tuscaloosa | Injun John's, Inc. |
| **ALASKA** | |
| Fairbanks | Electronic World |
| **ARIZONA** | |
| Cottonwood | A & W Graphics Co. |
| Lake Havasu City | Book Nook |
| Phoenix | TRI-TEK Computers |
| Sierra Vista | Livingston's Books |
| Tempe | Books, Etc. |
| | Computer Library |
| Tucson | Anderson News Co. |
| **ARKANSAS** | |
| Fayetteville | Vaughn Electronics/Radio Shack |
| Ft. Smith | Hot Off the Press Newsstand |
| Little Rock | Anderson News Co. |
| **CALIFORNIA** | |
| Berkeley | Lyon Enterprises |
| Citrus Heights | Software Plus |
| Grass Valley | Advance Radio, Inc. |
| Half Moon Bay | Strawflower Electronics |
| Hollywood | Levity Distributors |
| | Stef-Jen, Inc. |
| La Jolla | Butler & Mayes Booksellers |
| Los Angeles | Circus of Books (2 Locations) |
| Marysville | Bookland |
| Napa | Bookends Bookstore |
| Oakland | DeLauer's News Agency |
| Sacramento | Deibert's Readerama |
| | Tower Magazine |
| San Francisco | Booksmith |
| | Bookworks |
| | Castro Kiosk |
| Santa Monica | Midnight Special Bookstore |
| San Jose | Computer Literacy Bookshops |
| Santa Rosa | Sawyer's News, Inc. |
| Stockton | Harding Way News |
| | Paperbacks Unlimited |
| Sunnyvale | Computer Literacy |
| Torrance | El Camino College Bookstore |
| **COLORADO** | |
| Aurora | Aurora Newsstand |
| Colorado Springs | Hathaway's |
| Denver | News Gallery |
| Glenwood Springs | The Book Train |
| Grand Junction | Readmore Book & Magazine |
| Longmont | City Newsstand |
| **DELAWARE** | |
| Middletown | Delmar Co. |
| Milford | Milford News Stand |
| Newark | Newark Newsstand |
| Wilmington | Normar, Inc.—The Smoke Shop |
| **DISTRICT OF COLUMBIA** | |
| Washington, DC | Chronichles |
| | News Room |
| | World News, Inc. |
| **FLORIDA** | |
| Boca Raton | Great American Book Co. |
| | Software, Software, Inc. |
| Clearwater | The Avid Reader |
| Cocoa | The Open Door |
| Dania | Dania News & Books |
| Davie | Software Plus More |
| Ft. Lauderdale | Bob's News & Book-Store |
| | Clarks Out of Town News |
| | Mike's Electronics Distributor |
| Gainesville | Paper Chase |
| Jacksonville | Book Co. |
| | The Book Nook |
| | White's of Downtown Bookstore |
| North Miami Beach | Almar Bookstore |
| Panama City | Boyd-Ebert Corp. |
| Pensacola | Anderson News Co. |
| Pinellas Park | Wolf's Newsstand |
| **FLORIDA (cont'd)** | |
| South Pasadena | Poling Place Bookstore |
| Starke | Record Junction, Inc. |
| | Radio Shack Dealer |
| Sunrise | Sunny's at Sunset |
| Tallahassee | Anderson News Co. |
| | DuBey's News Center |
| Titusville | Computrac |
| **GEORGIA** | |
| Atlanta | Border's |
| Bremen | Bremen Electronics/Radio Shack |
| Forest Park | Ellers News Center |
| Jesup | Radio Shack |
| Marietta | Act One Video |
| Thomasville | Smokehouse Newsstand |
| Toccoa | Martin Music Radio Shack |
| **IDAHO** | |
| Boise | Book Shelf, Inc. |
| Moscow | Johnson News Agency |
| **ILLINOIS** | |
| Belleville | Software or Systems |
| Champaign | Bookmark |
| Chicago | B. Dalton Booksellers |
| Decatur | Book Emporium |
| | K-Mart Plaza |
| | Northgate Mall |
| East Moline | Book Emporium |
| Evanston | Norris Center Bookstore |
| Kewanee | Book Emporium |
| Lisle | Book Nook |
| Lombard | Empire Periodicals |
| Newton | Bill's TV Radio Shack |
| Paris | Book Emporium |
| Peoria | Book Emporium |
| | Sheridan Village |
| | Westlake Shopping Center |
| | Illinois News Service |
| Springfield | Book Emporium |
| | Sangamon Center North |
| | Town & Country Shopping Ctr. |
| Sunnyland | Book Emporium |
| West Frankfort | Paper Place |
| Wheeling | North Shore Distributors |
| **INDIANA** | |
| Angola | D & D Electronics |
| | Radio Shack |
| Berne | White Cottage Electronics |
| Bloomington | Book Corner |
| Columbus | Micro Computer Systems, Inc. |
| Crawfordsville | Koch's Books |
| Dyer | Miles Books |
| Franklin | Gallery Book Shop |
| Garrett | Finn News Agency, Inc. |
| Indianapolis | Bookland, Inc. |
| | Borders Bookshop |
| | Delmar News |
| | Indiana News |
| | Southside News |
| Lebanon | Gallery Book Shop |
| Martinsville | Radio Shack |
| Wabash | Mitting's Electronics |
| **IOWA** | |
| Davenport | Interstate Book Store |
| Des Moines | Thackery's Books, Inc. |
| Fairfield | Kramers Books & Gifts |
| Ottumwa | Southside Drug |
| **KANSAS** | |
| Hutchinson | Crossroads, Inc. |
| Topeka | Palmer News, Inc. |
| | Town Crier of Topeka, Inc. |
| Wellington | Dandy's/Radio Shack Dealer |
| Wichita | Amateur Radio Equipment Co. |
| | Lloyd's Radio |
| **KENTUCKY** | |
| Hazard | Daniel Boone Gulf Mart |
| Henderson | Matt's News & Gifts |
| Hopkinsville | Hobby Shop |
| Louisville | Hawley-Cooke Booksellers (2 Locations) |
| Paducah | Radio Shack |
| **LOUISIANA** | |
| Baton Rouge | City News Stand |
| New Orleans | Sidney's News Stand Uptown |
| Monroe | The Book Rack |
| **MAINE** | |
| Bangor | Magazines, Inc. |
| **MAINE (cont'd)** | |
| Brockton | Voyager Bookstore |
| Caribou | Radio Shack |
| Oxford | Books-N-Things |
| Sanford | Radio Shack |
| **MARYLAND** | |
| College Park | University Bookstore |
| **MASSACHUSETTS** | |
| Boston | Eastern Newsstand |
| Brockton | Voyager Bookstore |
| Cambridge | Out Of Town News |
| Ipswich | Ipswich News |
| Littleton | Computer Plus |
| Lynn | North Shore News Co. |
| Swansea | Newsbreak, Inc. |
| **MICHIGAN** | |
| Allen Park | Book Nook, Inc. |
| Birmingham | Border's Book Shop |
| Durand | Robbins Electronics |
| E. Detroit | Merit Book Center |
| Harrison | Harrison Radio Shack |
| Hillsdale | Electronics Express/Radio Shack |
| Holland | Fris News Company |
| Howell | Howell Auto Parts |
| Lowell | Curt's Sound & Home Arcade Center |
| Muskegon | The Eight Bit Corner |
| Niles | Michiana News Service |
| Perry | Perry Computers |
| Riverview | Riverview Book Store |
| Roseville | New Horizons Book Shop |
| **MINNESOTA** | |
| Burnsville | Shinder's Burnsville |
| Crystal | Shinder's Crystal Gallery |
| Duluth | Carlson Books |
| Edina | Shinder's Leisure Lane |
| Minneapolis | Shinder's (2 Locations) |
| Minnetonka | Shinder's Ridge Square |
| Roseville | Shinder's Roseville |
| St. Paul | Shinder's Annex |
| | Shinder's Maplewood |
| | Shinder's St. Pauls |
| Willmar | The Photo Shop |
| **MISSOURI** | |
| Farmington | Ray's TV & Radio Shack |
| Flat River | Ray's TV & Radio Shack |
| Florissant | Book Brokers Unlimited |
| Jefferson City | Cowley Distributing |
| Kirksville | T&R Electronics |
| Moberly | Audio Hut |
| St. Louis | Book Emporium |
| St. Robert | Bailey's TV & Radio |
| **MONTANA** | |
| Butte | Plaza Books |
| Whitefish | Consumer Electronics of Whitefish |
| **NEBRASKA** | |
| Lincoln | Nebraska Bookstore |
| Omaha | Nelson News |
| **NEVADA** | |
| Carson City | Bookcellar |
| Las Vegas | Hurley Electronics |
| | Steve's Books & Magazines |
| **NEW HAMPSHIRE** | |
| Keene | Radio Shack Associate Store |
| Manchester | Bookwrights |
| West Lebanon | Verham News Corp. |
| **NEW JERSEY** | |
| Atlantic City | Atlantic City News Agency |
| Cedar Knolls | Village Computer & Software |
| Clinton | Micro World II |
| Marmora | Outpost Radio Shack |
| Pennsville | Dave's Elect. Radio Shack |
| Rockaway | Software Station |
| **NEW MEXICO** | |
| Alamogordo | New Horizons Computer Systems |
| Albuquerque | Front Page Newsstand |
| | Page One Newsstand |
| Santa Fe | Downtown Subscription |
| **NEW YORK** | |
| Amherst | Village Green-Buffalo Books |
| Brockport | Lift Bridge Book Shop, Inc. |
| Brooklyn | Cromland, Inc. |
| Elmira Heights | Southern Tier News Co., Inc. |
| Fredonia | On Line: Computer Access Center |
| Hudson Falls | G.A. West & Co. |

**NEW YORK (cont'd)**

| | |
|---|---|
| Huntington | Oscar's Bookshop |
| Johnson City | Unicorn Electronics |
| New York | Barnes & Noble—Sales Annex |
| | Coliseum Books |
| | Eastern Newsstand |
| | Grand Central Station, Track 37 |
| | 200 Park Ave., (Pan Am #1) |
| | 55 Water Street |
| | World Trade Center #2 |
| | First Stop News |
| | Idle Hours Bookstore |
| | International Smoke Shop |
| | Jonil Smoke |
| | Penn Book |
| | Software City |
| | State News |
| | Walden Books |
| | World Wide Media Services |
| Pawling | Universal Computer Service |
| Rochester | Village Green |
| | World Wide News |
| Woodhaven | Spectrum Projects |

**NORTH CAROLINA**

| | |
|---|---|
| Cary | News Center in Cary Village |
| Chapel Hill | University News & Sundry |
| Charlotte | Newsstand Int'l |
| | Papers & Paperback |
| Havlock | Computer Plus |
| Hickory | C² Books & Comics |
| Jacksonville | Michele's, Inc. |
| Kernersville | K & S Newsstand |
| Marion | Boomers Rhythm Center |
| Winston-Salem | K & S Newsstand (3 Locations) |
| | Rainbow News Ltd. |

**OHIO**

| | |
|---|---|
| Akron | Churchill News & Tobacco |
| Blanchester | JR Computer Control |
| Canton | Little Professor Book Center |
| Chardon | Thrasher Radio & TV |
| Cincinnati | Cinsoft |
| Cleveland | Erieview News |
| Columbiana | Fidelity Sound & Electronics |
| Columbus | B5 Software |
| | Micro Center |
| | The Newsstand |
| Dayton | Books & Co. |
| | Huber Heights Book & Card |
| | Wilke News |
| | Wright News & Books |
| Dublin | Book Barn |
| Fairborn | News-Readers |
| | Wilke's University Shoppe |
| Findley | Open Book |
| Kent | The News Shop |
| Lakewood | Lakewood International News |
| Lima | Edu-Caterers |
| Miamisburg | Wilke News |
| Parma | Bookmark Newscenter |
| Toledo | Leo's Book & Wine Shop |
| Warren | Book Nook, Inc. |
| Xenia | Fine Print Books |
| Youngstown | Plaza Book & Smoke Shop |

**OKLAHOMA**

| | |
|---|---|
| Oklahoma City | Merit Micro Software |
| Taklequah | Thomas Sales, Inc. dba Radio Shack |
| Tulsa | Steve's Book Store |

**OREGON**

| | |
|---|---|
| Eugene | Libra Books — Book Mark |
| Portland | Fifth Avenue News |
| | Rich Cigar Store, Inc. |
| | Sixth & Washington News |
| Salem | Capitol News Center |
| | Checkmate Book |

**PENNSYLVANIA**

| | |
|---|---|
| Allentown | Owl Services |
| Altoona | Newborn Enterprises |
| Bryn Mawr | Bryn Mawr News |
| Feasterville | Global Books |
| King of Prussia | Gene's Books |
| Malvern | Personal Software |
| Phoenixville | Stevens Radio Shack |
| Reading | Smith's News & Card Center |
| Temple | Software Corner |
| West Chester | Chester County Book Co. |
| Wind Gap | Micro World |
| York | The Computer Center of York |
| | Tollgate Bookstore |

**RHODE ISLAND**

| | |
|---|---|
| Newport | Bellevue News |
| Warwick | Software Connection |

**SOUTH CAROLINA**

| | |
|---|---|
| Charleston Hts. | Software Haus, Inc. |
| Clemson | Clemson Newsstand |
| Florence | Ray's #1 |
| Greenville | Palmetto News Co. |
| Spartanburg | Software City |
| Union | Fleming's Electronics |

**TENNESSEE**

| | |
|---|---|
| Brentwood | Bookworld #5 |
| Chattanooga | Anderson News Co. |
| | Guild Books & Periodicals |
| Dickson | Highland Electronics |
| Knoxville | Anderson News Co. |
| | Davis-Kidd Bookseller |
| Memphis | Computer Center |
| Nashville | Davis-Kidd Booksellers |
| | Mosko's Place |
| | R.M. Mills Bookstore |
| Smyrna | Delker Electronics |

**TEXAS**

| | |
|---|---|
| Big Spring | Poncho's News |
| Brenham | Moore's Electronics |
| Desoto | Maxwell Books |
| Elgin | The Homing Pigeon |
| Harlington | Book Mark |

**UTAH**

| | |
|---|---|
| Provo | Valley Book Center |

**VIRGINIA**

| | |
|---|---|
| Danville | K & S Newsstand |
| Hampton | Benders |
| Norfolk | I-O Computers |
| | Turn The Page |
| Richmond | Volume I Bookstore |

**WASHINGTON**

| | |
|---|---|
| Port Angeles | Port Book & News |
| Seattle | Adams News Co., Inc. |
| | Bulldog News |
| Tacoma | B & I Magazines & Books |
| | Nybbles 'N Bytes |

**WEST VIRGINIA**

| | |
|---|---|
| Huntington | Nick's News |
| Logan | Stan's Electronics & Radio Shack |
| Madison | Communications, LTD |
| Parkersburg | Valley News Service |
| South Charleston | Spring Hill News |

**WISCONSIN**

| | |
|---|---|
| Appleton | Badger Periodicals |
| Cudahy | Cudahy News & Hobby |
| Kenosha | R.K. News, Inc. |
| Madison | Pic A Book |
| | University Bookstore |
| Milwaukee | Juneau Village Reader |
| Racine | Little Professor Book Center |
| Waukesha | Holt Variety |

**ARGENTINA**

| | |
|---|---|
| Cordoba | Information Telecommunicationes |

**AUSTRALIA**

| | |
|---|---|
| Blaxland | Blaxland Computers |
| Kingsford | Paris Radio Electronics |

**CANADA:**
**ALBERTA**

| | |
|---|---|
| Banff | Banff Radio Shack |
| Blairmore | L & K Sports & Music |
| Bonnyville | Paul Tercier |
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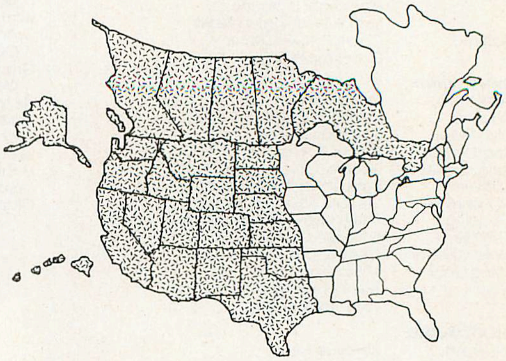

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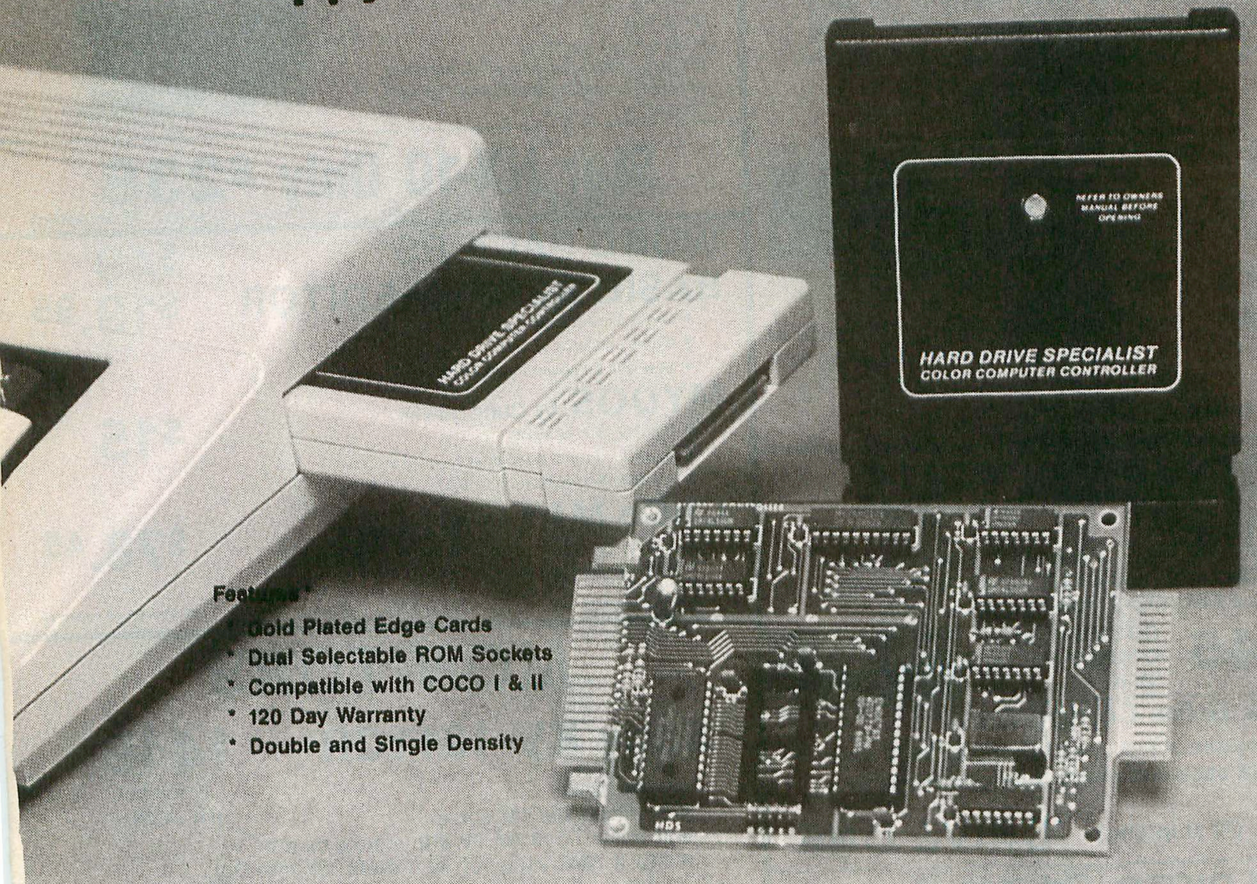

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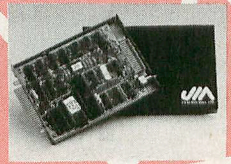

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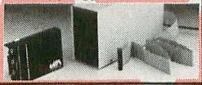

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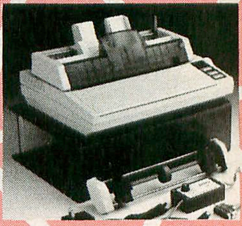

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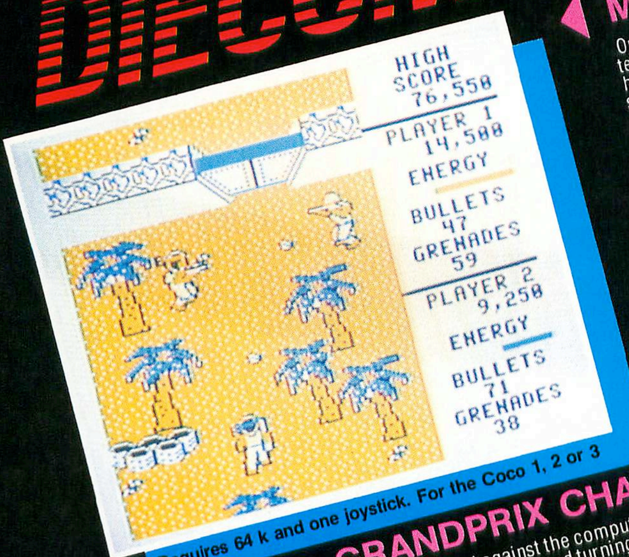
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Requires 64 k and one joystick. For the Coco 1, 2 or 3

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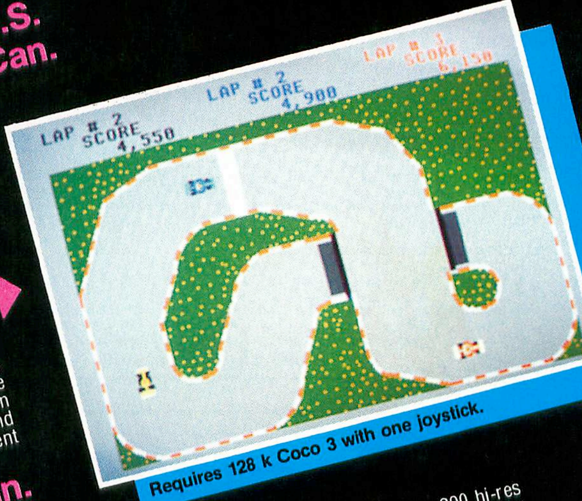
LAP # 1 SCORE 6,150
LAP # 2 SCORE 4,900
LAP # 2 SCORE 4,550

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It's back and better than ever. It's Gantelet II for your Coco 3. Using 320 × 200 hi-res graphics with 16 colors, we have created one of the best arcade style games you will ever see for your Coco. Four people can now play simultaneously in one game. Dozens of new levels with new monsters will challenge even the best players. Collect keys to open doors and chests, treasures, and many new magic potions to help you battle more powerful monsters. Watch out for hidden traps as you search for the exit to next level.

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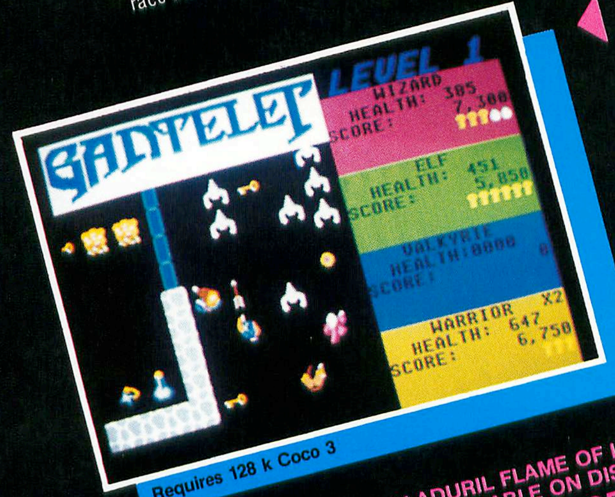
GANTELET
LEVEL 1
WIZARD HEALTH: 385 SCORE: 7,300
ELF HEALTH: 451 SCORE: 5,850
VALKYRIE HEALTH: 0000 SCORE:
WARRIOR HEALTH: 647 SCORE: 6,750

Requires 128 k Coco 3

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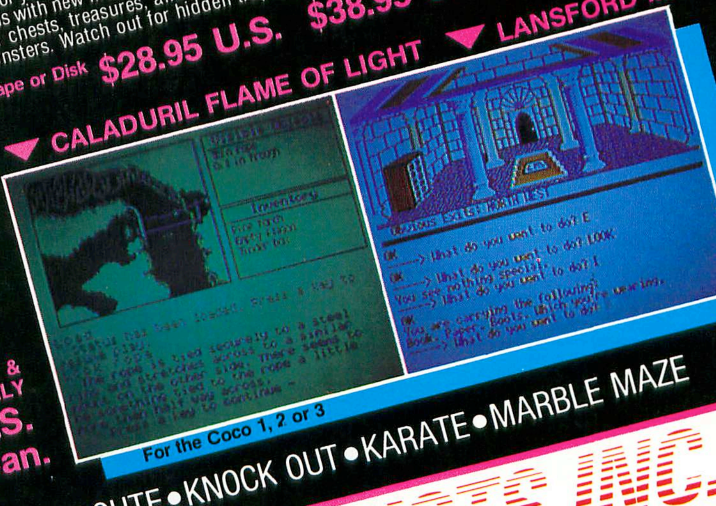
## LANSFORD MANSION



For the Coco 1, 2 or 3

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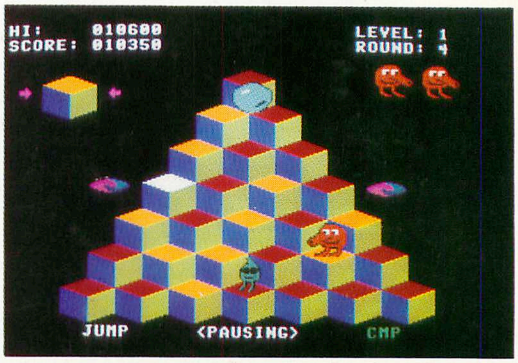

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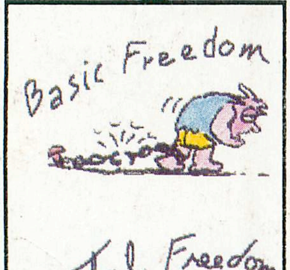

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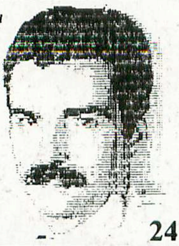

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